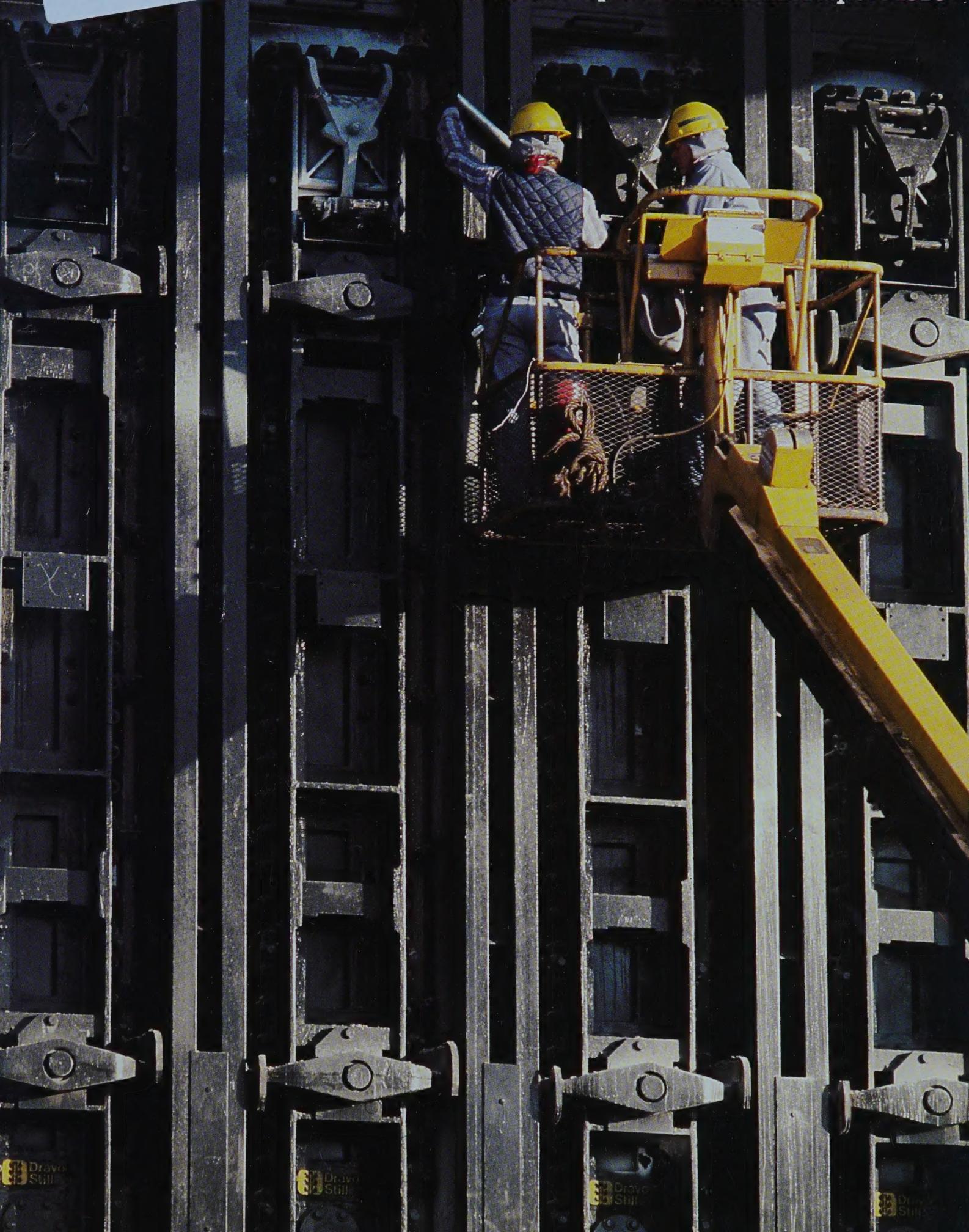


AR51

Dravo Corporation Annual Report 1979



Dravo Corporation's worldwide activities encompass a broad range of process, technological, engineering, construction, facility operation and other services to the mining, minerals and metals, electric power, petroleum, chemical, pulp and paper, food processing and transportation industries and to the public sector. The company is also involved in natural resources development, barge transportation, manufacturing and equipment sale and rental.

Contents

2	Letter to Shareholders
5	Directors and Officers
6	Strategy for a New Decade
17	Operations Review
27	Financial Review
31	Financial Statements
35	Notes to Financial Statements
40	Accountants' Report
41	Five-Year Summary
42	Supplemental Information
44	Products and Services

Cover: Increasing the content of process technology in engineering construction operations was central to Dravo's corporate strategy during the 1970's. Applying technology licensed from a West German firm, we have been successful in penetrating the coking market in recent years. The 72-oven battery shown on the cover—designed and built for Citizens Gas & Coke Utility, Indianapolis—was dedicated in January, 1980.

Dravo

Dravo Corporation
One Oliver Plaza
Pittsburgh, PA 15222
412-566-3092

Ross C. Feltz
Manager, Public Relations
and Communications Services

Financial Highlights

1

Dravo Corporation

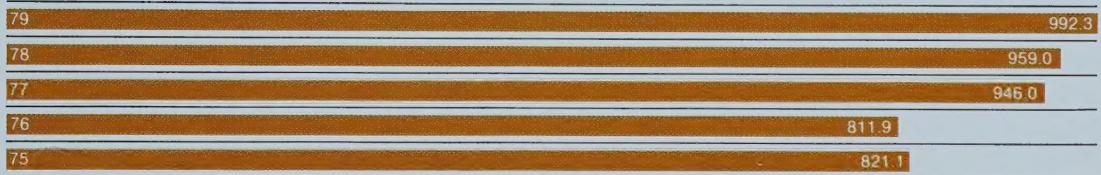
In thousands, except per share

December 31

	1979	1978
Revenue	\$ 992,332	\$ 959,044
Net income	28,180	25,217
Per common share		
Net earnings	\$ 3.47	\$ 3.43
Dividends declared	1.28	1.16
Book value	28.03	25.91
Backlog		
To be reported as revenue	\$1,286,000	\$1,011,000
To be performed	1,173,000	921,000

Revenue*

(In millions of dollars)



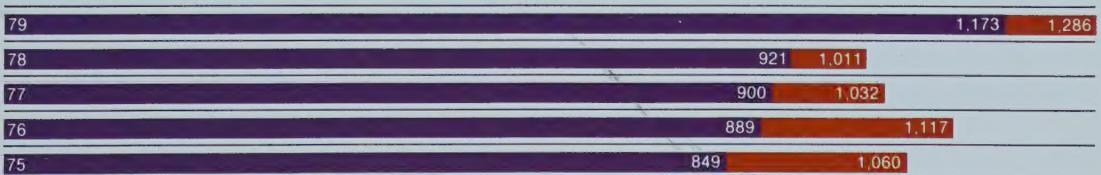
Net Income*

(In millions of dollars)

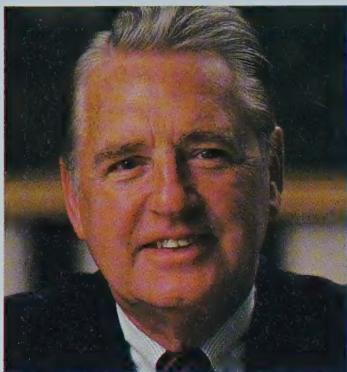


Backlog

(In millions of dollars)



*From continuing operations



Robert Dickey III

I am pleased to report that your company recorded its ninth consecutive year of profit improvement in 1979 and entered the 1980's well positioned for a period of continuing growth.

Highlights of 1979 included a 12 percent increase in net income

over the previous year; bookings of \$1.28 billion, 30 percent above our former high; and a record backlog of \$1.29 billion. Earnings of \$3.47 per common share were slightly above the \$3.43 reported in 1978, which reflected an average of approximately 800,000 fewer shares outstanding during the year. All financial information for 1978 has been restated to include Southern Industries Corporation which merged with Dravo on June 1, 1979.

Early in 1980, the Board of Directors voted to increase the common stock dividend to \$1.36 annually from the previous rate of \$1.28. It is the eighth consecutive year that the dividend has been raised.

While the principal purpose of this Annual Report is to outline your company's performance in the year just ended, it is appropriate to also examine those continuing efforts that promote further growth and improved profitability. As an ongoing procedure, we devote considerable time and effort to guiding our future through an extensive program of strategic planning that functions at both the unit and corporate levels. This program is the theme of a special section that begins on page 6. I am sure that you will find it of interest.

One of the most significant developments over the last several years has been our thrust into the international marketplace. This effort produced positive results in 1979, with foreign bookings of over \$350 million, an amount greater than our total corporate bookings just ten years ago.

Throughout the Operations Review section of this report, you will note specific references to a wide range of new foreign projects that include a crude oil desalting complex in Saudi Arabia, iron ore agglomerating plants in Mexico and Taiwan, a coal handling facility in Australia, electric power generating stations in Egypt, Saudi Arabia and Taiwan and power substations in North Yemen. Also late in the year, in-depth technical discussions with representatives of the People's Republic of China resulted in a major order for towboats and barges to be used on the Yangtze River system.

Our entry into the international market on a broad front has required a substantial commitment of both people and money. But the decision to establish a permanent Dravo presence in areas of particular promise, in lieu of periodic sales calls, has been justified. These areas include the Middle East, the Far East and Latin America.

Increasingly, over the last several years, our engineering and construction activity has involved large complex projects requiring the diverse skills and disciplines of two or more of our operating units. To better present ourselves as the large, integrated, worldwide engineering organization that we are, and to more effectively employ our total capability for handling major projects, we consolidated all of our engineering construction units with the Dravo International staff organization and its network of foreign subsidiaries and affiliates to form a new operating company, Dravo Engineers and Constructors. In conjunction with this organizational change, we have initiated a major program to expand the range of our process technology.

By design, about one-half of our business is generally produced from our engineering construction operations and typically is in the form of major, relatively long-term projects. This work is balanced with results of other activities such as natural resources, manufacturing, transportation and equipment sale and rental that generate revenue and profits on more of a day-to-day basis.

A major expansion of this latter type of business resulted from the merger of Southern Industries Corporation with Dravo. Southern Industries operates throughout the Gulf Coast region from Florida to Texas. Its products include lime, shell, sand

and gravel, slag and construction materials. The subsidiary's lime production, together with the Maysville, Kentucky lime operation of our Natural Resources Group, makes Dravo the second largest producer of this material in the United States.

The addition of Southern Industries will help establish a Dravo presence and identity in the Sun Belt area, one of the fastest growing regions in the nation.

Dravo Lime Company continued to increase its production as additional power plants started up and began to receive shipments of lime for stack gas scrubbing. Full operation at a rate of one million tons of lime per year is targeted for 1981 when the last three electric power generating units covered by our long-term lime contracts are scheduled to go on stream. In the meantime, we will be selling metallurgical lime to the extent that the market demand permits.

Another new operation, our joint venture coal mine in Wyoming, began shipments during the year. Deliveries from the underground mine, which we are building as operating partner with Rocky Mountain Energy Company, a Union Pacific Corporation subsidiary, will increase during 1980, with full production expected by 1983. The 1.5-million-ton annual output is committed to a mid-western power station under a 20-year contract.

Late in the year we changed the name of our barge line subsidiary to Dravo Mechling Corporation from the former Union Mechling designation. This change was made to more clearly reflect the barge line's relationship to other units of the company. Paced by increased grain shipments, Dravo Mechling showed significant improvement in both earnings and revenue in 1979, following several years of depressed results.

We have noted in the past the many and varied ways in which Dravo participates in the primary energy markets with its products and services.

By the mid-1980's we expect that fully half of our business, directly or indirectly, will stem from these sources.

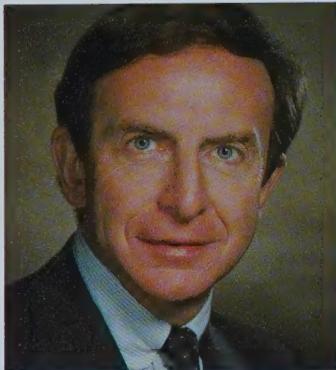
Regrettably, the nation still lacks the definitive energy policy that is needed to give direction to efforts by industry and government to alleviate critical shortages and escalating costs of fuels, notably petroleum. It would appear that at long last there is a more favorable climate, both public and governmental, for development of a full-fledged synthetic fuels industry. Certainly the costs of extracting oil from shale, diatomaceous earth or tar sands, or of producing synthetic oil from coal, become more competitive with each increase in the price of gasoline and fuel oil.

Dravo has more than 30 years of experience in the development of synthetic fuels and energy conservation technology and is currently involved in several significant projects aimed at making these technologies commercially viable. While we are convinced that development of a synthetic fuels capability should be by private industry, there is no question that because of the magnitude of the investment involved, government support of some type will be required.

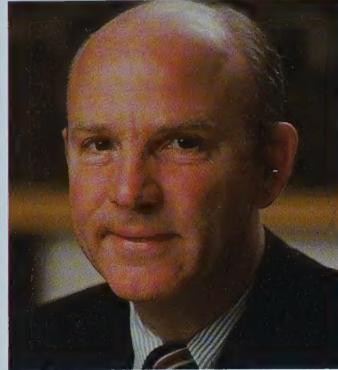
Another area of major concern is nuclear power. The impact of the Three Mile Island incident, coupled with the efforts of small but vocal protest groups, has succeeded in clouding the future of this source of electric power.

As our experience in designing and building power generating facilities and supplying piping and other materials includes fossil fuel and hydro plants as well as nuclear, we see little if any impact on our business from this situation. However, we are concerned that our nation will be facing grave shortages of electric power before the end of the century if development of nuclear energy is curtailed or halted.

We noted earlier the importance that we attach to planning our corporate future. Certainly no element in this process is of greater importance than the attraction and retention of high-calibre people. Our expansion into the international



Thomas F. Faught, Jr.



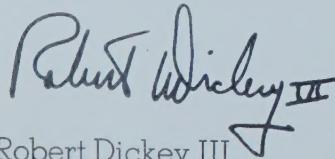
Philip J. Berg

marketplace reflects the ability of Dravo people to deal successfully with a broad range of new situations including language and cultural differences, overseas travel and communications, new sources of materials, equipment and finance, and training of indigenous personnel in skills ranging from field construction to high technology and facilities management.

In response to these and other employee training and development needs, the company has sponsored attendance by some 2,000 employees at in-house and outside courses and seminars. Further assistance has been provided through our Tuition Refund Program under which nearly 900 employees are enrolled in higher education programs.

We are pleased to welcome two new members to Dravo's Board of Directors. Richard B. Patton, area director, H. J. Heinz Company, and Ken L. Lott, chairman and chief executive officer of The Merchants National Bank of Mobile, bring additional valuable experience and perspective to our Board.

Looking ahead, the effects of inflation, recession and other factors on the world economy are difficult to predict. Despite these uncertainties, we are entering the 1980's with a record backlog of work and a continuing good level of inquiries in most of our businesses. These factors, together with our strong financial position, give us cause for optimism about our continued growth and prosperity in the years ahead.


 The signature of Robert Dickey III, written in cursive ink.

Robert Dickey III
Chairman and President

February 20, 1980

Directors and Officers

Directors

Robert Dickey III
Philip J. Berg
Thomas F. Faught, Jr.
Ralph B. Gilpatrick, Jr.
Vice Chairman
Mellon Bank N.A. (Banking)
Richard R. Hough
Executive Vice President
American Telephone & Telegraph Company
(Communications)
Ken L. Lott
Chairman and Chief Executive Officer
The Merchants National Bank of Mobile (Banking)
Allison R. Maxwell, Jr.
Director and Honorary Chairman of the Board
Wheeling-Pittsburgh Steel Corporation
(Integrated producer of steel and steel products)
Joseph A. Neubauer
Director and Retired President
PPG Industries, Inc.
(Manufacturer of glass, chemicals, resins and
fiberglass products)
Richard B. Patton
Area Director
H. J. Heinz Company
(Food products and ingredients)
L. Stanton Williams
Chairman of the Board and Chief Executive Officer
PPG Industries, Inc.
(Manufacturer of glass, chemicals, resins and
fiberglass products)

Officers

*Robert Dickey III
Chairman, President and Chief Executive Officer
*Philip J. Berg
Executive Vice President, Operations
*Thomas F. Faught, Jr.
Executive Vice President, Finance and
Corporate Development
James D. Copeland
Senior Vice President,
Planning and Employee Relations
Rodney S. Gould
Senior Vice President, Corporate Affairs
James P. Kelly
Group Vice President, Natural Resources
Charles A. Patten
Group Vice President, Manufacturing
Dudley E. Dawson, Jr.
Vice President;
Chairman, Southern Industries Corporation

James R. Sharpe
Vice President;
President, Dravo Engineers and Constructors
E. P. Additon
Vice President;
Senior Vice President, Development
Dravo Engineers and Constructors
J. R. Byrnes
Vice President;
Senior Vice President, Operations
Dravo Engineers and Constructors
Alexander Matiuk
Vice President;
President, Gibbs & Hill, Inc.
Noel F. Boyd
Vice President, General Manager
Chemical Plants Division
Donald P. Courtsal
Vice President, General Manager
Engineering Works Division
Charles R. Cox
Vice President, Aggregates
Gustav Schwab
Vice President, General Manager
Pipe Fabrication Division
Robert L. Watson, Jr.
Vice President, General Manager
Civil, Mining & Marine Division
Robert E. Gee
Vice President, New Technology and Planning
Walter E. Hinrichs
Vice President, Corporate Development
Frederick A. Joss
Vice President, Treasurer
Robert E. Mertz
Vice President, General Counsel and Secretary
George J. Newhams
Vice President, Investor Relations
Joseph V. Newman
Vice President, Controller
John D. Peters
Vice President, Purchasing and Traffic
Willem H. Thorbecke
Vice President;
President, Dravo International

*Corporate Policy Committee

At Dravo Corporation, strategic planning is an annual, formalized process by which management determines corporate business directions for the five-year period following a given planning year. A more immediate result of effective planning is the creation of an environment in which current business alternatives may be reviewed in proper relationship to long-range objectives of the corporation.

Planning at Dravo involves every member of the management team. It includes an extensive annual examination of both external conditions and internal resources, and results in the allocation of those resources in accordance with corporate goals. The planning process, then, is viewed as a primary responsibility of management.

The business and market perspective provided in previous planning cycles have shaped the character and operating philosophy of our company today. Similarly, corporate performance during the first half of the 1980's will reflect plans already formulated. Key elements of our strategy for the new decade are presented in this section.

Photo: Each autumn, members of the Corporate Policy Committee schedule time away from their routine duties to conduct an in-depth review and evaluation of the plans of each operating and staff unit in the context of overall Dravo plans and objectives.



Dravo Corporation begins the 1980's as a balanced enterprise, and balance will continue to be descriptive of company operations during the decade. By design, the characteristics of individual businesses complement and supplement those of others. As a result, strengths of certain geographic markets offset weaknesses in others; stability offsets cyclical; and security offsets risks.

Overall, we seek a degree of balance that will produce a stable earnings base even as we engage in other activities which are distinguished by their capacity for high returns. This combination provides safeguards against market and economic fluctuations while generating funds for investment in further expansion efforts or for the development of promising businesses. A key objective: to maintain a diversified, technologically-based organization that is stronger and less vulnerable as a whole than any of its component parts.

The character and balance of Dravo today conforms generally to a blueprint for growth established during the early 1970's. Recognizing that internal growth would occur more rapidly in our engineering construction operations, acquisition and development activities were concentrated on expanding those businesses which produce day-to-day results.

As planned, the income contribution of these producers rose throughout the period. By 1979, with inclusion of Southern Industries, the performance of our manufacturing, natural resources, equipment and transportation units accounted for more than one-half of total corporate revenue.

In the 1980's, it is anticipated that this increase in capital-intensive business will be matched by growth in engineering construction activity. Further acquisitions, coupled with planned internal growth, will preserve a desired balance among revenue and income sources.



Photos: Above—Dravo has major engineering offices in five cities in the United States and in several overseas locations. Right—This lime calcining plant in Alabama is one of many Dravo natural resource processing facilities throughout the nation.



Record bookings of \$1.28 billion in new work in 1979 included some \$350 million in international markets. The year's bookings performance, therefore, is consistent with the corporate objective for the eighties of obtaining approximately 25 percent in annual revenue and earnings from non-domestic sources.

Broad geographic diversification is viewed by management as vital to sustaining a desired rate of growth. The establishment of a Dravo presence in diverse international markets has provided access to abundant opportunities for our engineering construction skills and, in time, for our manufacturing and natural resources capabilities as well. It also positions us to capitalize on increased business activity that may occur in any world region or in any single industrialized or developing nation.

The corporate program of international expansion will be accelerated during the new decade.

The mid-1970's restructuring of Dravo's approach to international business included the decision to intensify marketing efforts in world regions offering the greatest long-term opportunities. The regions targeted for attention were the Middle East, Latin America and the Far East.

As a result of ongoing programs to develop industry and necessary support systems, industrial expansion in the three areas is expected to exceed the growth rate of the world's economy throughout all of the 1980's. In anticipation of this increase in business activity, market coverage for company products and services is being provided by affiliate and subsidiary companies in most key locations, and by direct Dravo representation in others.

The effectiveness of efforts to establish a corporate presence in these important markets is reflected in our 1979 bookings performance. Specific contract awards are described in the Operations Review of this report.



Photos: Above—Working through affiliate companies in Indonesia and Thailand, Rotterdam-based F.C. deWeger Internationaal, B.V. is one of several units of Dravo Engineers and Constructors active in the Far East. Right—While the principal thrust of our international effort is in engineering construction, we also encounter selective opportunities for the overseas sale of marine equipment and other manufactured products.



Zhang Shaozhen

Guo Longmeng

The planning process at Dravo includes an assessment of markets served. An analysis of our strengths and competitive positions, combined with our interpretation of worldwide economic conditions and other external factors, indicates that an aggressive effort in three broad markets will best enable us to achieve our objectives during the 1980's. The target markets:

- Basic energy: fuels, electric power and energy conservation.
- Primary industries: iron and steel, nonferrous metals and chemicals.
- Supporting industries: construction materials, water resources, environmental improvement and marine transportation.

The continued development of our capabilities in these areas permits us to meet expanding client needs while maintaining an appropriate degree of market diversification.

No present Dravo market matches energy in its capacity for growth. During the research stage of previous planning cycles, however, it became apparent that our ability to participate fully in that expansion would be determined by the range of company products and services available in the marketplace. Development programs proceeded accordingly and, as the new decade begins, some 15 Dravo units are engaged in 34 separate businesses which relate to energy.

Despite the degree of market coverage we now enjoy, we continue to plan for the rapid rate of change that is characteristic of the energy industry. We expect to maintain our present strong market position and project that approximately one-half of total 1985 revenues will represent products and services supplied to primary energy markets.



Photos: Dravo's technical expertise relates to both the traditional and developing source of energy. Above—Five of our operating units furnished services, products or materials for this large new electric generating station near Pittsburgh. Right—A process to produce a coal-oil composite fuel, developed jointly with a Florida utility, is now being scaled up to meet commercial requirements.



One-third of total 1979 revenues were generated by activities new to Dravo in the past 10 years. Results during the 1980's will continue to reflect a planned combination of new and mature revenue sources. In 1980 and beyond, for example, as long-term supply contracts take effect and as production facilities move toward full capacity, our lime and coal projects in Kentucky and Wyoming, respectively, are expected to contribute significantly to corporate earnings.

In regard to profit stability, rate of return, compatibility with existing businesses and contribution to balance, these ventures meet Dravo's criteria for capital-intensive investment. Meanwhile, developing businesses involving a greater degree of technological orientation include synthetic fuels from coal, oil shale and tar sands, and processes to conserve industrial energy. The acquisition and licensing of proprietary technology will continue to complement our internal development activity.

Dravo approaches the eighties with the appetite and flexibility to broaden our range of operations and to expand our technical base.

Dravo's results in recent years have reflected the contributions of a variety of new activities. The considerable expansion of engineering construction services, for example, is represented in 1979's year-end backlog.

This increase in technological capability will be reflected in corporate performance during the 1980's. Developed and acquired skills in synthetic fuels, coke production, pulp and paper processes and non-ferrous metal technology all match favorably with industry needs to expand or refit existing production capacity.

The application of technical skills has reduced substantially the reliance on fixed-price, public works projects that characterized our engineering construction operations just 10 years ago.



Photos: Creative financing techniques have contributed to the recent expansion of our operational base. Funding of both the Dravo Lime Company facility in Maysville, Kentucky and the Carbon County Coal Company mine complex in Hanna, Wyoming (above), was based on long-term supply contracts. Financing of this nature has permitted the conventional borrowing capacity of the corporation to be applied to new business development and acquisition activity. Right—The ability to provide complementary financial services is an increasingly important factor in booking major contracts. Operating unit managers participate with our financial staff in developing appropriate project financing.







Engineering Construction: James R. Sharpe, President, Dravo Engineers and Constructors.

Earnings from engineering construction operations rose to \$31.0 million, an increase of about seven percent over 1978, on a reduced revenue of \$424.1 million.

As noted in the President's Letter, the units of our former Engineering Construction Group and the Dravo International staff organization, together with its network of international subsidiaries and affiliates, were combined into a single operating company in January, 1980.

The new organization's nine principal units supply comprehensive design, engineering, construction, operation and maintenance, and project and construction management services to a broad range of industrial clients and to government agencies.

Merging of these activities into a single organization will permit us to employ our extensive technical skills and project management capabilities more effectively for our customers and, internally, will result in improved planning and management.

As one of its initial steps, Dravo Engineers and Constructors is mounting a major effort to expand and increase its technological expertise. Following an extensive, in-depth evaluation of strengths

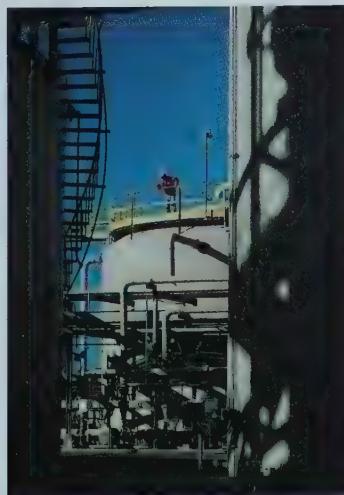
and weaknesses in this area, it has initiated a program to fill in the technology "gaps." This effort will be carried out in conjunction with the corporate New Technology & Planning Department.

Results from engineering construction operations during 1979 reflected our growing participation in international projects, a continued emphasis on contracts for facilities operation and maintenance, and work for the iron and steel and electric utility industries. Major new contracts were obtained for work in Mexico, the Middle East, Australia and the Far East, and three new foreign affiliate companies were formed.

Several significant projects were booked in the Middle East. In Saudi Arabia we will design and construct a crude oil treatment facility for ARAMCO under a contract in excess of \$100 million. The project, at Safaniya on the nation's east coast, will include modifications to an existing gas/oil separating facility and construction of a new 600,000-barrel-per-day crude oil desalter.

Other new business in the area includes design, engineering and startup services for a gas-fired electric power generating station in Egypt; design, engineering and other services for power and desalination facilities at the new Yanbu industrial complex in Saudi Arabia; startup, operation and maintenance of a new power plant and desalination facility at Ghazlan, Saudi Arabia; and design and construction of six

Photos (left to right): Russell Dam, under construction on the Savannah River; Uranium recovery plant, designed and built for Mobil Oil Corporation; Electric furnace melt shop, designed and engineered for Jones & Laughlin Steel Corporation.



electric power substations in North Yemen.

The assignments in Egypt and at Yanbu are being performed by Gibbs & Hill, Inc., our New York-based engineering and construction subsidiary. The work in North Yemen is by Dravotec, S.p.A., an affiliate formed in 1979 to consolidate Dravo's equity interests in three Italian affiliates into a single engineering, construction and manufacturing organization. Headquartered in Milan, Dravotec is active throughout North Africa and the Middle East as well as in Italy.

In the Far East, joint ventures were established to pursue market opportunities in two nations—Filipinas Dravo Corporation in the Philippines and GIBSIN Engineers Ltd. in Taiwan. Also, an office of Asian affairs was established in Hong Kong to coordinate a wide range of business activities in the area including the People's Republic of China. New assignments in the region included design and construction of an iron ore sinter plant and engineering and procurement services for a combined-cycle power station in Taiwan, and construction management services for a major concrete and earth-filled dam in the Philippines that is being built on the Magat River north of Manila. Another Philippine assignment, received early in 1980, is to furnish consulting services for an industrial development that is planned for the island of Leyte.

A third joint venture company was formed in

Mexico to market Dravo's full scope of engineering, construction and manufacturing capabilities. Shortly after its establishment, Dravo de Mexico, S.A. de C.V. received a contract to design and build an iron ore concentrating and pelletizing plant near Monterrey, Mexico.

Operating highlights abroad included the completion of a major iron ore handling facility and two coal handling projects in Australia, and an oil unloading jetty in Sierra Leone.

Domestic business was marked by a high level of activity involving the iron and steel industry. Two major contracts were booked for electric furnace melt shops, while a similar Dravo-designed facility was completed during the year. We are designing and building the two-furnace facility at the Johnstown, Pennsylvania plant of Bethlehem Steel Corporation that is central to the \$100-million rehabilitation program under way at the site. And design and procurement services are being furnished for a similar facility for Republic Steel Corporation at Warren, Ohio, where we are also designing a coke plant wastewater treatment system. A 1.8-million-ton-per-year electric furnace shop for Jones & Laughlin Steel Corporation in Pittsburgh began operation in late summer.

Other activity for the iron and steel industry included completion of a coke gas desulfurization facility for Wheeling-Pittsburgh Steel Corporation and a coke plant emission control system for



Allied Chemical Corporation. Initial operation of a large new coke plant in Indianapolis began late in the year, and a contract was received for a coke plant emission control system for Kaiser Steel Corporation at Fontana, California.

Early in 1980 we were authorized by Algoma Steel Corporation, Ltd., to proceed with detailed engineering for a 75-oven coke battery at the firm's Sault Ste Marie steelmaking complex in Canada. The new battery will have an annual output in excess of 500,000 tons and will have an installed value of more than \$50 million.

Dravo has been building a broad technological base in synthetic fuels for more than 30 years. Experience encompasses most major processes for converting coal into synthetic oil and gas and for extraction of oil from shale and other minerals. This activity intensified in 1979 as part of the national effort to develop new sources of energy.

Design continued on a large coal-to-gas demonstration plant for the Illinois Coal Gasification Group under a design contract funded by the U.S. Department of Energy, and on a pilot plant for the solvent extraction of oil from diatomaceous earth for Getty Oil Company. Underground engineering studies began for a major oil company for an oil shale extraction project in Colorado.

Gibbs & Hill, a recognized worldwide engineer constructor in the power field, was active in nuclear plant projects in Brazil, Italy, the Philip-

pines, Spain, Turkey and the United States. Work was also performed for a large coal-fired facility in North Carolina and for several other fossil-fueled units.

In other energy-related activities, development of underground sites for the storage of petroleum reserves continued in Louisiana and Texas under our operation and maintenance contract from the Department of Energy. A uranium leaching and processing facility was completed for Mobil Oil Corporation in Texas, and Gibbs & Hill was awarded a contract to serve as architect/engineer for a solar energy development project being carried out by an Arizona electric utility. A large coal preparation plant was completed for Marrowbone Development Company in West Virginia, while work got under way on a similar facility for American Electric Power Company in Ohio.

In the civil area, we received a contract to perform additional construction at the Shoreham nuclear power station of Long Island Lighting Company, a project with which we have been involved since 1970. Another large construction project is Russell Dam on the Savannah River, which we are building as sponsor of a joint venture. The venture's work at this site was extended through award of a \$25.3-million contract for rock-fill continuation work, bringing the total value of the project to \$88.4 million.



Photos (left to right): Oil unloading jetty, designed and built for Kissy Oil Company in Sierra Leone; Coal-fired power station, designed for Indianapolis Power & Light Company; Container-board mill, designed and built for Owens-Illinois, Inc. in Wisconsin; Coal preparation plant, designed and built for Marrowbone Development Company in West Virginia.





Manufacturing: Charles A. Patten, Group Vice President.

Manufacturing Group operations in 1979 produced revenue of \$231.4 million and income of \$16.2 million. In achieving these record results, the group capitalized on its opportunities in traditional markets while also

making inroads into new areas of business.

Operating one of the nation's largest inland shipyards at Neville Island, near Pittsburgh, Engineering Works Division established a new production record by launching 355 hulls during the year. The previous record was 302 launches, set in 1972. Another milestone was the early 1980 launching of the 50th towboat in the Viking line designed and introduced by the unit early in the 1970's.

New marine bookings kept pace with the year's high production level, and our backlog of orders for this equipment now extends into the first quarter of 1981. Barge orders reflected an active market for dry bulk transportation that is expected to continue throughout 1980, and more recent bookings indicate a growing demand for double-skin tank barges for the movement of liquid cargoes. Legislation requiring the increased use of double-skin hulls is a prominent barge industry issue. A growing market for towboats is expected

in the early 1980's as river operators add vessels to keep pace with the expanded barge fleets.

A significant 1979 booking was received from the People's Republic of China. The order, for four 6,000-horsepower towboats and 30 barges for use on the lower Yangtze River, is Dravo's first from China.

We have been participating with the Chinese in lengthy technical discussions and reviews of river conditions in China while also hosting Chinese delegations for similar reviews in the United States. It is expected that this relationship will lead to other opportunities for Dravo participation in development of China's waterways.

Dravo SteelShip, a subsidiary located at Pine Bluff, Ark., produces a smaller line of river and harbor vessels. The unit's improved performance in 1979 resulted from an active market for workboats and more efficient production procedures. An order was booked for nine pilot boats to be used on the Panama Canal.

The renewed national interest in coal was evidenced by increased activity in the materials handling area, as client inquiries for facilities and equipment increased markedly late in the year. Contracts for the design and construction of complete coal handling facilities were received from Seminole Electric Cooperative, Inc., Florida Power Corporation and the Ohio River Company.

Pipe Fabrication Division, headquartered at



Photos (left to right): Custom grating fabrication at our new Wetas-Kiwin plant in Canada; Coal transfer terminal, designed and built for International Marine Terminals near New Orleans; Piping fabricated for a gas compressor station in Pennsylvania; Barge under construction at our Neville Island (Pa.) shipyard.



Marietta, Ohio and with plants there and in Charlotte, North Carolina, booked several sizable orders for piping systems at coal-fired power plants. Although domestic work for the nuclear industry declined, piping orders were received for nuclear power generating facilities in the Philippines and Taiwan.

Because of the slowdown in construction of new power facilities in the United States, the division has been working to adapt its fabrication and marketing skills to other applications. This effort resulted in significant contracts for process piping from Atlantic Richfield Company and Kaiser Aluminum & Chemical Corporation. A new organization formed by the division to supply a broad range of Manufacturing Group services to the gas utility industry was awarded contracts for construction management, pipe fabrication and procurement services for new facilities of two gas utilities.

Fabricated Products Division reported improved results in the marketing of existing product lines while successfully introducing several new products. All heating, ventilating and air conditioning equipment manufactured at Hastings, Nebraska is now being marketed under the Dravo/Hastings name. Three new heating units—the Pyro-port™ portable construction heater; the Door/Wall heating system; and the Thermo-flo waste oil heater, which burns vehicle and equipment waste crank-

case oil—received strong dealer and customer interest.

The division's Structural Products Department operates fabrication plants at Hagerstown, Maryland; Litchfield, Illinois; Pittsburgh, Pennsylvania; and Wetaskawin, Alberta, Canada. These facilities produce grating used as flooring and walkways in power plants and industrial facilities. Sales of this product were well above forecasted levels. A new product, Tru-Weld™ industrial handrail, was introduced during the year.

Dravo Lectro Quip achieved substantial success in its first full year of operation. The organization markets the proprietary Lectro Clear™ wastewater treatment system and the Dravo deep-bed filter system. Contracts were secured from Amax Inc. for engineering a mine tailing discharge waste treatment process and from Texstar, Inc. for two waste treatment systems in Saudi Arabia.

Dravo Technology Services also won improved market acceptance during its first full year. The unit employs broad Manufacturing Group engineering and technology to assist clients with startup services on new equipment or with extending the life of existing equipment. Assignments included replacement of an ore bridge for Inland Steel Company, rehabilitation of a ship unloader for New England Power Company and rebuilding of cranes for the U.S. Navy.





Natural Resources: Dudley E. Dawson, Jr., Chairman, Southern Industries Corporation (upper left); James P. Kelly, Jr., Group Vice President (lower left).

This segment of our business is carried out by two units, the Pittsburgh-based Natural Resources Group and Southern Industries Corporation, headquartered in Mobile, Alabama. The latter organization merged with Dravo effective June 1, 1979.

Combined, these operations produced 1979 results substantially above those of the previous year, with earnings of \$20.6 million on revenue of \$214.5 million.

Southern Industries achieved its improved results despite severe damage to Mobile and nearby Gulf Coast areas in September by Hurricane Frederic, the worst storm to hit Alabama in more than half a century. The massive cleanup following the storm brought business in the area to a near-standstill for much of the fourth quarter.

A developer of basic resources, the unit is active throughout the Gulf Coast states, carrying out its business through five principal operating subsidiaries. Principal products are aggregates, construction materials, chemical and agricultural

lime, poultry feed calcium supplement and filler material for roofing and industrial rubber products. Results for the year in most product lines showed improvement over 1978 levels.

Marketing some 11 million tons of aggregates annually, Southern Industries ranks as one of the largest aggregate producers in its region. It occupies a similar position in the lime market, shipping a total of 2,000 tons per day from three plant locations. Lime is marketed to the pulp and paper, aluminum, steel, chemical and other industries and for water purification, soil stabilization and roadbuilding applications.

Radcliff Materials, Inc., largest of Southern Industries' operating subsidiaries, produced about five million tons of oyster and clam shell from deposits in Mobile Bay and two locations in Louisiana. Radcliff markets shell as a base material for road construction and for manufacture of cement and lime. A portion is also crushed and sold as a poultry feed supplement.

Additionally, Radcliff operates two river sand and gravel dredging operations in Alabama and another in Florida, and markets construction materials such as ready-mixed concrete, asphaltic mixes and concrete block in Mobile, Pensacola, New Orleans and Houston.

In 1979, the company was awarded a long-term transportation contract by Ideal Basic Industries, Inc., to transport approximately three million



Photos (left to right): Stacker-reclaimer, designed and fabricated for a power station near San Antonio, Tex.; Entry portals for our new joint venture coal mine in Wyoming; Morgan City (La.) lime plant of our new subsidiary, Southern Industries Corp.; Unloading shipment of lime from our Maysville (Ky.) plant at a terminal in Ohio; Loading gravel at Aggregates Division quarry at Apple-grove, Ohio, for shipment to our Charleston (W. Va.) distribution facility.



tons of limestone, sand and clay annually from Ideal's quarry on the Alabama River to that firm's new cement plant south of Mobile. Twenty barges and three towboats presently under construction will be dedicated to this movement, which is scheduled to begin in the fall of 1980.

Southern Stone Company, a subsidiary which specializes in land-based resources including crushed stone, sand, gravel and slag, operates seven stone quarries in Alabama and four slag plants in Tennessee and Florida. It also markets agricultural limestone.

Results for the Pittsburgh-based Natural Resources Group also were well above 1978 levels. The group's activities include three aggregate operations in the Ohio Valley, a large limestone mining and lime calcining facility in Kentucky and a coal mining joint venture in Wyoming.

Carbon County Coal Company, the affiliate owned jointly by Dravo and Rocky Mountain Energy Company, a Union Pacific Corporation subsidiary, made its initial shipment of coal as scheduled in late summer.

The venture's mine, located near Hanna, Wyoming, should reach full production—about 1.5 million tons per year—by 1983. Some 29 million tons of low-sulfur coal will be shipped from the underground mine to a station of Northern Indiana Public Service Company over a 20-year period.

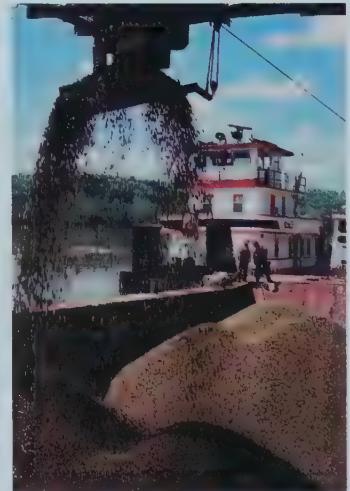
Dravo Lime Company's one-million-ton-per-year lime complex at Maysville, Kentucky completed its third year of operation. Production continued to increase as long-term supply contracts with electric utilities go into effect concurrent with the startup of new generating units. An additional long-term contract was signed with Cincinnati Gas & Electric Company early in 1980.

The output at Maysville nearly doubled the 1978 level, and the plant's third kiln was placed in operation in the spring of 1979.

Shipments to two other large generating units are scheduled to begin in 1980 and three more in 1981, bringing the plant to full operation. The Thiosorbic® lime produced at the Maysville facility removes sulfur dioxide from power plant stack gases with greater efficiencies than other wet scrubbing methods and without scaling.

Another product marketed by Dravo Lime is Calcilox® hardening agent, used in stabilizing power plant scrubber sludge, coal fines and other materials. Shipments began late in the year to Allegheny Power System's new Pleasants Power Station in West Virginia.

A new unit, Aggregates Division, was formed late in the year to more closely coordinate management of the group's three Ohio Valley sand and gravel operations—the former Keystone Division in Pittsburgh, Ohio Gravel Division in Cincinnati and Criss & Shaver Division in West Virginia.



Criss & Shaver completed its first year as a part of Dravo with satisfactory results. Acquired at the beginning of the year, the unit markets sand, gravel and ready-mixed concrete in Charleston, Huntington and Ravenswood. Aggregates are quarried from deposits along the Ohio River. A number of modifications to its plant and equipment were made during the year and are expected to permit increased production in future years.

Weak construction markets and strikes by building trades workers hampered aggregate operations in Pittsburgh and Cincinnati. Pittsburgh-area results were further impacted by a strike of dredge personnel early in the year.



Equipment: Richard F. Smail, President, Dravo Equipment Company.

Dravo Equipment Company sells, leases and services a variety of heavy construction, earthmoving and logging equipment through three operating divisions—Dravo Doyle in Western Pennsylvania and West Virginia, Dravo Marks in Ohio and Dravo Cal-Ore in the Pacific Northwest.

Earnings of Dravo Equipment Company were \$866 thousand while revenue was \$72.3 million, down from the record level of the previous year.

The lower results reflect delays in the projected expansion of coal production in the eastern United States, continued government regulations that affect the surface mining industry, and the extreme rise in interest rates during the year, factors that caused many firms to defer equipment purchases.

Despite its depressed level of activity, the coal industry remains the largest market for Dravo Doyle and Dravo Marks. Accordingly, the two units continued to expand their capacity to participate more fully in this important sector. Two new sales-service facilities were opened in the heart of coal mining areas—Dravo Doyle's 15,000-square-foot facility at Somerset, Pennsylvania, and Dravo Marks' 18,000-square-foot outlet at Hopedale, Ohio.

The year's largest booking—a \$4.2-million order for eight giant Komatsu D-455 tractor dozers—was obtained by Dravo Doyle from C&K Coal Company. This Pennsylvania mining firm now has 13 of the dozers, one of the largest on the market, all of them supplied by Dravo Doyle. Another sizable booking, by Dravo Marks, was for four Fiat-Allis HD-31 tractor dozers for Central Ohio Coal Company. This American Electric Power Company subsidiary now has eight HD-31 dozers in operation.

The general construction and industrial markets were at a good level in Ohio, and Dravo Marks



Photos (left to right): Southern Industries Corp. shell dredging operation in Mobile Bay; A truck-mounted drill, purchased from Dravo Marks, at a mine operation in Ohio; Dravo Doyle's new sales and service facility at Somerset, Pa.; Deckhands on a Dravo Mechling tow on the Ohio River; Loading grain from Dravo Mechling barges into ocean vessel near New Orleans.



added the Liebherr line of hydraulic backhoe equipment to further strengthen its product mix. The industrial market was also strong in the areas served by Dravo Doyle.

Dravo Cal-Ore continued its efforts to obtain a greater volume of construction and industrial business to help lessen its reliance on the timber industry. The unit has reduced its investment in equipment inventory in line with the relatively low level of activity in the marketplace.

Several new types of equipment were introduced to add depth to the unit's product lines. These include Hitachi hydraulic backhoes and log loaders, Kawasaki front-end loaders and Garrett-Weldco log skidders. These additions have enabled the division to offer a more complete range of services.



Transportation: Lester E. Sutton, President, Dravo Mechling Corporation.

Dravo Mechling Corporation, our recently renamed river transportation subsidiary, reported revenue of \$66.5 million and income of \$7.0 million in 1979. Both figures are substantially

higher than those recorded a year ago when first quarter results were impacted by severe winter weather.

Other factors contributing to the improved results were the consolidation and restructuring of operations; an increased volume of grain shipments; and actions to counteract the rising cost of fuel oil.

Consolidation efforts centered on increasing operational efficiency by reducing the incidence of idle barges and by decreasing equipment maintenance and port expense. A Memphis repair facility was closed as towboat maintenance operations were concentrated in Pittsburgh and New Orleans. In a similar manner, fleeting operations in New Orleans are being consolidated at a single location. As a result of this streamlining, the organization is now able to respond more rapidly to market needs.

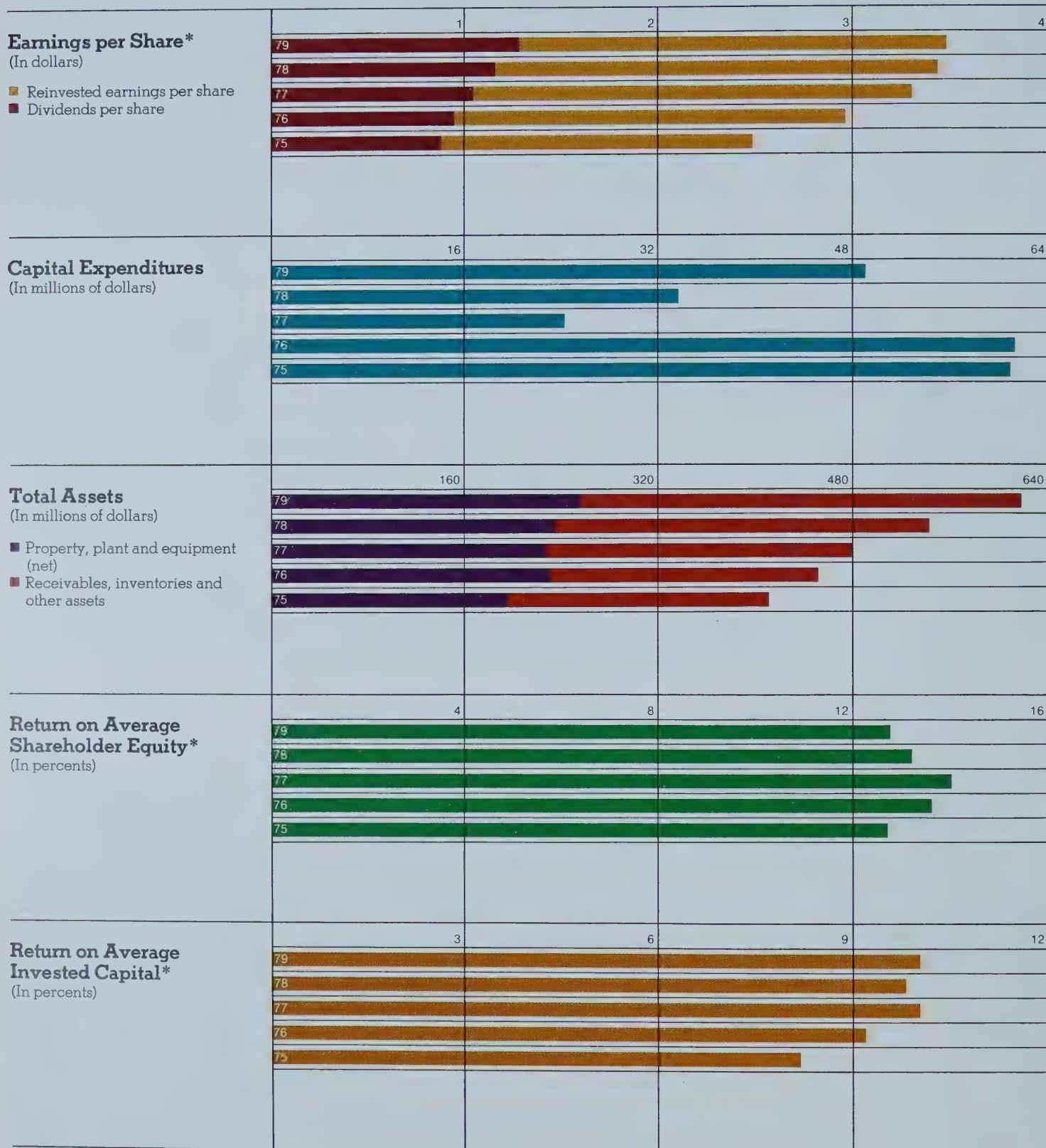
A higher volume of grain traffic was handled during the year, with movements of this commodity conducted both under long-term contracts and on a spot market basis. Lime, salt and petroleum products also contributed to improved transportation revenues, while steel tonnage declined.

Because of the rising costs and, at times, limited availability of fuel oil, Dravo Mechling has initiated a variety of practices to encourage fuel conservation. At the same time, a growing number of our contract movements are now protected by appropriate fuel escalation clauses.

The subsidiary disposed of two of its older towboats, further improving fleet efficiency.



Dravo Corporation



*From continuing operations

Dravo Corporation

In 1979, net income increased to \$28.2 million, 12 percent above the previous year, as revenue reached a new high. Earnings per share of \$3.47, based on a higher number of shares outstanding, increased slightly above 1978's \$3.43 earnings. Dravo's year-end backlog of future revenue increased 27 percent to \$1.29 billion.

Funds of \$68 million were generated from operations, after interest expense and taxes, the issuance of common stock and the sale of capital assets. These funds were more than sufficient to meet capital expenditures of \$49 million and increased dividends of \$10.6 million.

As interest rates increased during 1979, attention was focused on new financing arrangements. Short-term borrowings at near-prime interest rates, principally commercial paper, were replaced with medium-term loans at lower rates. In another action to reduce interest expense, fee-basis credit agreements were arranged in 1979 to replace credit lines that required compensating cash balances.

Entering 1980, Dravo's sound financial condition, improved liquidity, expected level of internally-generated funds and available lines of credit provide the financial flexibility necessary for planned growth through expansion of existing operations, new ventures and acquisitions.

Merger with Southern Industries

The merger of Southern Industries Corporation with Dravo was completed in June, 1979, following approval by shareholders, with the exchange of two million common shares. After restatement to include this operation, Dravo's capital structure changed somewhat as Southern Industries' debt level increased the previously reported 1978 debt-to-equity position from 50 percent to a restated 66 percent.

New Financing Arrangements

At year-end 1979, the debt-to-equity position increased to 70 percent from 1978's restated 66 percent.

In October, 1979, a \$25-million medium-term bank loan was arranged, with \$10 million at a fixed 10 percent rate and \$15 million at a rate which will float between 9½ and 10¾ percent. The loan was used to repurchase outstanding commercial paper which was issued for working capital needs. The loan provides a favorable hedge against high interest rates that were experienced in 1979 and expected during the near future.

Earlier in 1979, a \$34-million loan at 9.95 percent was arranged by Southern Industries. This loan, which is repayable from 1982 through 1994, was used to combine two existing debt obligations.

Project financing for \$25 million of Dravo's investment in the Carbon County Coal Company partnership was completed. This advance, from an institutional lender in the form of a proceeds-production payment, will be repaid at 9.45 percent out of Dravo's share of the facility's operating income.

Backlog

As of year-end 1979, the backlog to be reported as revenue increased 27 percent to \$1.29 billion, of which \$1.17 billion represented work yet to be performed. The increase followed a resurgence of Engineering Construction con-

tract awards during 1979 and Manufacturing's excellent level of marine equipment orders. This includes approximately \$350 million of assignments from foreign customers. Backlog amounts by segment at year-end compare as follows:

Backlog to be reported as revenue (In millions)	1979	1978
Engineering Construction	\$ 626	\$ 372
Manufacturing	335	284
Natural Resources	344	368
Intersegment items	(19)	(13)
	\$1,286	\$1,011

Orders of our Natural Resources, Equipment and Transportation segments, other than long-term contracts, are not included in backlog since they are completed shortly after receipt. The 1979 year-end backlog also does not include Dravo's share of the long-term coal supply contract of Carbon County Coal Company, an unconsolidated affiliate.

Capital Expenditures

Additions to property, plant and equipment in 1979 totaled \$49 million, compared with \$33.5 million in 1978 including expenditures by Southern Industries. The 1979 expenditures include \$10.9 million of additions arising from the January, 1979 acquisition of the Criss & Shaver group of companies, a West Virginia producer of aggregates and ready-mixed concrete. An additional \$20.5 million was expended in Natural Resources operations, principally for marine equipment to be used for transporting aggregates, modifications to the Kentucky lime facility and equipment employed in extraction operations. Other major expenditures during 1979 include \$6.9 million for improvements and expansion of computer facilities and office space in New York and Pittsburgh, \$4 million for additions and improvements to Dravo Mechling's fleet, and \$3 million for manufacturing facility improvements.

Common Stock Market Prices

The high and low common stock sales prices for each quarterly period in 1979 and 1978 as reported for New York Stock Exchange composite transactions were:

Quarter	1979		1978	
	High	Low	High	Low
First	\$29 1/8	\$24 7/8	\$28 3/4	\$25 1/8
Second	30 3/4	23 7/8	29 1/8	26 1/8
Third	32 1/8	28 5/8	30 1/2	25 1/2
Fourth	31 1/8	25 5/8	35 1/8	25 1/4

Dividends

In January, 1979, the quarterly cash dividend was raised 10.3 percent to 32 cents per common share, from 29 cents.

Again, in January, 1980, the dividend was increased 6.2 percent to 34 cents, or \$1.36 per share on an annual basis, marking Dravo's eighth consecutive year of dividend increases and the 157th quarter of uninterrupted dividend payments. Common dividends reflected a 36-percent payout from 1979 earnings, compared with 33 percent from 1978 earnings.

Total 1979 dividends, including common dividends declared by Southern Industries prior to the June, 1979 merger and \$410 thousand declared on preference stock, amounted to \$10.6 million. Dividends paid in 1978 were \$8.7 million on about 11 percent fewer shares outstanding.

Revenue and Earnings Review

Dravo achieved record-setting revenue of \$992.3 million in 1979 compared with \$959.0 million in 1978. Previously reported financial information has been restated to include Southern Industries Corporation in Dravo's Natural Resources segment.

Net income of \$28.2 million for 1979 reflects a 12-percent increase over the previous year's \$25.2 million. Earnings per share of \$3.47 were slightly above the \$3.43 per share earned in 1978. Per share earnings are based on a 1979 average of eight million shares outstanding compared with 7.2 million in 1978. The increase in average shares resulted principally from the 800,000-share common stock offering in September, 1978 and an issuance of 132,891 shares in the January, 1979 acquisition of the Criss & Shaver group of companies.

The 1979 income contribution from segments, totaling \$75.7 million, increased 18 percent from 1978's \$64.2 million. Dravo's 1979 revenue and income results of the five operating segments, shown in the table on the facing page, is discussed below.

Engineering Construction revenue decreased nine percent in 1979 to \$424.1 million, reflecting a lower level of work in ore processing, pulp and paper, and petrochemical-polymer areas. In 1979, increased revenues were achieved on projects involving fossil and nuclear power generation facilities in the United States and abroad, and domestic cokemaking facilities for steel and chemical applications.

Engineering Construction's slightly higher 1979 income contribution includes, after provision for related expenses, Dravo's \$5.5-million share in final settlement of litigation on the New York City Water Tunnel project. Selling and administrative expenses related to the pursuit of new engineering construction orders in worldwide markets remained at a high level.

Manufacturing revenue and income improvements in 1979 resulted from an increased level of marine equipment completions—355 vessels compared with 262 in 1978. Materials handling system work, however, was below record 1978 results. The 1979 income includes a \$1.2-million gain realized from the sale of the Fabricated Products Division's Neville Island plant which became idle following the consolidation of operations in Hastings, Nebraska.

Natural Resources revenue and income bettered 1978 results by 31 percent and 25 percent, respectively. Southern Industries, which accounts for about two-thirds of Natural Resources' revenue, achieved improved results from shell operations, while lime revenue increased following the 1978 acquisition of Texas-based Round Rock Lime Company. Another acquisition, Criss & Shaver, led to higher revenue for the Aggregates Division; income results of this operation were hampered by severe first quarter weather, decreased construction activity in the Pittsburgh and Cincinnati areas and strikes by building trades workers. Dravo Lime contributed higher revenue and income as contract lime shipments increased toward original tonnage commitments of electric utility customers. The segment's income was reduced by anticipated expenses associated with the development of Carbon County Coal's mining operation and other potential Natural Resource opportunities.

Equipment's income contribution fell sharply from 1978 as revenue decreased 19 percent. Lower capital spending by coal mining customers in Ohio, Pennsylvania and West Virginia was the principal factor. Also, logging equipment sales in the Pacific Northwest decreased severely for the second consecutive year.

Transportation revenue and income were substantially above 1978 results, which had been severely impacted by ice and winter weather. Grains, liquid petroleum products and lime shipments provided most of the revenue increase. The income improvement also reflects the gain from sale of two towboats, which were phased out of Dravo Mechling's river operations early in 1979, and several low-tonnage-capacity barges.

Review of 1978 segment results compared with 1977 shows a similar revenue decline in Engineering Construction. The segment's income improvement in 1978 benefited from lower costs than provided for on contracts completed in prior years. Manufacturing revenue and income declined in 1978 due to lower pipe and process equipment fabrication work; this was nearly offset by improved marine equipment and materials handling system activity. Manufacturing income in 1977 also reflected the consumption of lower-valued LIFO inventories. Natural Resources' 1978 results, which have been restated to include Southern Industries, included a higher level of lime shipments to contract customers of the Kentucky lime plant and Southern Industries' 21-percent revenue improvement. Transportation revenue increased 19 percent in 1978; ice-jammed winter river conditions impacted operations during both years. Sales to coal mining customers provided Equipment's 1978 record revenue performance while income performance was hampered by contraction of the logging equipment markets of the Pacific Northwest operation.

Interest expense increased to \$17.6 million in 1979 from \$12.8 million in 1978 due to rising interest rates and a higher level of borrowings for working capital requirements. Short-term financing rates, principally on commercial paper, averaged 11.0 percent during 1979 compared with 8.2 percent in 1978.

Segment revenue and income contribution

From continuing operations

(In millions)	1979	1978	1977	1976	1975
Revenue:					
Engineering Construction	\$424.1	\$463.8	\$529.7	\$504.1	\$502.8
Manufacturing	231.4	196.2	200.7	173.9	156.7
Natural Resources	214.5	164.1	130.6	107.9	92.7
Equipment	72.3	89.5	77.8	56.0	57.4
Transportation	66.5	56.1	47.0	47.3	39.2
Intersegment items	(16.5)	(10.7)	(39.8)	(77.3)	(27.7)
Total revenue	\$992.3	\$959.0	\$946.0	\$811.9	\$821.1
Income contribution:					
Engineering Construction	\$ 31.0	\$ 29.1	\$ 25.5	\$ 22.7	\$ 17.2
Manufacturing	16.2	12.0	15.0	12.5	10.0
Natural Resources	20.6	16.5	11.9	7.9	9.6
Equipment	.9	3.5	3.5	2.3	4.5
Transportation	7.0	3.1	1.2	5.1	1.5
From segments	75.7	64.2	57.1	50.5	42.8
Interest expense	(17.6)	(12.8)	(11.0)	(10.3)	(13.1)
Intersegment and corporate items	(10.7)	(9.4)	(8.1)	(7.6)	(3.2)
Total pre-tax income	\$ 47.4	\$ 42.0	\$ 38.0	\$ 32.6	\$ 26.5

Segments

Dravo operates within five segments—Engineering Construction, Manufacturing, Natural Resources, Equipment and Transportation. The nature of the business and products and the current activity of each segment are described on pages 17 through 25. Management's analysis of revenue and earnings, on page 28, includes comments on segment operating results. Revenue of Engineering Construction in 1977 included \$168.9 million from contract activity with a customer engaged in iron ore processing for the steel industry.

Revenue shown by segment includes both sales to non-affiliated customers, as reported on the company's consoli-

dated statement of income, and intersegment sales, as detailed below, which are principally at competitive market prices.

Intersegment Items

(In millions)	1979	1978
Engineering Construction	\$ 2.8	\$ 1.2
Manufacturing	7.0	4.3
Natural Resources	.6	—
Equipment	3.1	3.3
Transportation	3.0	1.9
	\$16.5	\$10.7

Other segment information

(In millions)	Assets Employed as of December 31,		Capital Expenditures		Depreciation and Amortization	
	1979	1978	1979	1978	1979	1978
Engineering Construction	\$152.8	\$112.3	\$ 9.0	\$ 5.4	\$ 3.4	\$ 3.3
Manufacturing	92.4	91.2	3.9	6.4	3.1	2.7
Natural Resources	212.5	180.6	31.4	18.8	13.9	11.4
Equipment	58.1	53.2	1.6	1.8	.7	.8
Transportation	74.4	72.6	4.0	1.3	3.8	4.1
Intersegment and corporate items	25.9	32.3	(.9)	(.2)	.6	.4
Total	\$616.1	\$542.2	\$49.0	\$33.5	\$25.5	\$22.7

Operations by geographic areas

(In millions)	Revenue		Income Contribution		Assets Employed as of December 31,	
	1979	1978	1979	1978	1979	1978
United States	\$947.6	\$905.8	\$74.3	\$59.3	\$555.2	\$475.6
Foreign	44.7	53.2	1.3	5.4	22.3	22.1
Corporate items	—	—	(28.2)	(22.7)	38.6	44.5
Total	\$992.3	\$959.0	\$47.4	\$42.0	\$616.1	\$542.2

Operations by geographic areas

Dravo conducts business on a worldwide scale by exporting from the United States principally its engineering, technology and construction management services, fabricated and manufactured products, and contractors' equipment; by construction operations in foreign areas; and by operations of subsidiary companies in foreign areas. During

1979, Dravo's international business activities, conducted in about 30 foreign nations, produced revenue of \$71 million from \$26 million of exports to nonaffiliated customers and \$45 million of revenue from foreign operations. This compares with \$87 million in 1978 from \$34 million of exports and \$53 million from foreign operations.

Consolidated Statement of Income

31

Dravo Corporation

In thousands, except per share

Year ended December 31	1979	1978
Revenue	\$992,332	\$959,044
Costs of construction, products and services	830,795	813,569
Gross profit	161,537	145,475
Selling, administrative and general expenses	101,306	92,917
Income from operations	60,231	52,558
Other income (expense):		
Equity in operations of unconsolidated affiliates	1,583	(615)
Dividend and interest income	3,163	2,821
Interest expense	(17,585)	(12,757)
Net other income (expense)	(12,839)	(10,551)
Income before taxes	47,392	42,007
Provision for income taxes	19,212	16,790
Net Income	\$ 28,180	\$ 25,217
Earnings per share:		
Primary	\$ 3.47	\$ 3.43
Fully diluted	3.37	3.29

Consolidated Statement of Retained Earnings

Dravo Corporation

In thousands, except per share

Year ended December 31	1979	1978		
Retained earnings at beginning of year	\$159,043	\$142,555		
Net income	28,180	25,217		
Gain on sale of treasury stock	—	1		
	187,223	167,773		
Per Share	1979	1978		
Dividends declared				
Series A preference stock	\$ —	\$.55	—	15
Series B preference stock	2.475	2.475	410	410
Common stock	1.28	1.16	8,963	6,079
Southern Industries common, prior to merger			1,223	2,226
	10,596			8,730
Retained earnings at end of year	\$176,627	\$159,043		

The accompanying notes are an integral part of these financial statements.

Consolidated Balance Sheet

Dravo Corporation

December 31	1979	1978
Assets		
Current assets:		
Cash	\$ 18,526	\$ 15,966
Marketable securities—at cost (approximates market)	2,700	4,164
Accounts and notes receivable	197,742	175,314
Inventories and costs on contracts in progress, net of billings of \$94.6 million in 1979 and \$95.5 million in 1978	88,426	71,234
Advances to and equity in joint ventures	9,886	5,349
Other current assets	6,801	3,159
Total current assets	324,081	275,186
Investments in and advances to unconsolidated affiliates	16,422	12,649
Drawings, patents, and other intangible assets	3,302	3,668
Other assets	16,448	16,915
Property, plant and equipment:		
Land	23,960	15,474
Mine development	4,785	4,789
Buildings and improvements	50,976	48,294
Floating equipment	133,155	129,549
Machinery and other equipment	204,787	185,106
	417,663	383,212
Less accumulated depreciation and amortization	161,832	149,460
Total property, plant and equipment	255,831	233,752
	\$616,084	\$542,170

The accompanying notes are an integral part of these financial statements.

In thousands

December 31	1979	1978
Liabilities and Shareholders' Equity		
Current liabilities:		
Notes payable and current portion of long-term notes	\$ 14,042	\$ 9,224
Accounts payable—trade	88,287	91,907
Wages and salaries, including vacations	18,504	13,977
Income taxes	16,807	12,343
Accrued retirement contributions	12,509	11,232
Other current liabilities	42,100	25,283
Total current liabilities	192,249	163,966
Long-term notes	92,019	71,788
Deferred income taxes	38,065	33,066
Other liabilities	6,323	5,274
Deferred revenue from future mineral production	55,437	57,825
Shareholders' equity:		
Preference stock, par value \$1, authorized 2,000,000 shares; issued 165,516 shares of \$2.475 cumulative convertible Series B (entitled in liquidation to \$9.1 million)	165	165
Common stock, par value \$1, authorized 20,000,000 and 12,000,000 shares; issued 8,097,596 and 7,923,847 shares	8,098	7,924
Other capital	51,058	47,087
Retained earnings	176,627	159,043
Treasury stock at cost; common shares: 81,819 and 107,640	(2,145)	(2,624)
Notes from employees for common stock purchases	(1,812)	(1,344)
Total shareholders' equity	231,991	210,251
	\$616,084	\$542,170

Consolidated Statement of Changes in Financial Position

34

Dravo Corporation

In thousands

Year ended December 31	1979	1978
Source of funds:		
Net income	\$ 28,180	\$ 25,217
Charges (credits) to income not involving funds:		
Depreciation and amortization	25,508	22,651
Deferred taxes and other expenses	6,048	9,032
Equity in operations of unconsolidated affiliates	(1,583)	615
From operations	58,153	57,515
Book value of capital assets sold	5,397	2,303
Proceeds from long-term notes	32,619	20,763
Common stock issued	4,145	23,097
	100,314	103,678
Application of funds:		
Purchase of property, plant and equipment	38,039	30,561
Reduction of long-term notes	12,449	5,732
Increase in investment in and advances to unconsolidated affiliates	2,220	2,074
Reduction of deferred revenue from future mineral production	2,388	2,175
Dividends	10,596	8,730
Non-current assets received from purchased companies:		
Property, plant and equipment	13,923	—
Drawings, patents and other assets	689	—
Assumption of long-term notes	(61)	—
Allocation of acquired net assets of Round Rock Lime Company	(4,558)	4,558
Other	4,017	2,453
	79,702	56,283
Change in working capital	\$ 20,612	\$ 47,395
Increase (decrease) in working capital:		
Cash and marketable securities	\$ 1,096	\$ (5,409)
Accounts and notes receivable	22,428	32,710
Inventories and costs on contracts in progress, net of billings	17,192	18,729
Advances to and equity in joint ventures	4,537	5,139
Notes payable	(4,818)	(2,905)
Accounts payable	3,620	8,708
Income taxes	(4,464)	3,147
Accrued retirement contributions	(1,277)	(2,274)
Wages and salaries, including vacations	(4,527)	(2,577)
Other	(13,175)	(7,873)
	\$ 20,612	\$ 47,395

The accompanying notes are an integral part of these financial statements.

Summary of significant accounting policies

Principles of consolidation The consolidated financial statements include the accounts of all wholly-owned subsidiaries except Dravo Leasing Company, whose condensed statements are included in these notes, and four real estate companies, which are not significant subsidiaries. The unconsolidated subsidiaries and qualifying affiliates are included in the statements on an equity basis.

Translation of foreign currencies The accounts of foreign subsidiaries have been translated using current exchange rates for cash, receivables and payables and historical rates for all other balance sheet accounts. Revenue and expense accounts are translated at weighted average rates during the year, except for amounts related to balance sheet accounts translated at historical rates. Foreign exchange adjustments are included in income currently.

Income recognition Income is recognized on fixed-price, long-term contracts, including those performed by joint ventures, in the period of physical completion and on reimbursable fee-type contracts as costs are incurred; however, provision is made currently for anticipated losses.

Income is recognized on manufactured products as each unit is delivered. Manufacturing profit on sales to Dravo Leasing Company, an unconsolidated subsidiary, is recognized upon delivery on finance-type leases. On operating-type leases, manufacturing profit is recognized on a straight-line basis over estimated rental life.

Inventories Inventories are valued at cost or market, whichever is lower. For manufacturing inventories, including finished goods, work in process, materials and manufacturing contracts in progress, cost is determined principally on a last-in, first-out (LIFO) basis; other inventories, including fabricated components shipped, repair parts and natural resource inventories, are principally carried at actual or current standard cost on a first-in, first-out (FIFO) basis. The cost of products produced includes raw materials, direct labor and operating overhead. For finished goods consisting of contractors' equipment held for rental or sale, costs are determined on an identified

unit basis, less estimated reductions attributable to rental service. Costs of engineering construction contracts in progress are stated at actual direct cost, including overhead at rates approximating actual cost.

Current accounts In accordance with industry practice, current assets and liabilities include amounts related to long-term contracts and joint ventures which have cycles extending beyond one year.

Property, plant, equipment and depreciation Property, plant and equipment are stated at cost. The cost of buildings, equipment and machinery is depreciated over estimated useful lives on a straight-line basis, except for long-lived assets employed at the Kentucky mining and lime processing facility which are depreciated on a unit of production method. For income tax purposes, depreciation is calculated principally on accelerated bases. Expenditures for maintenance and repairs which do not materially extend the life of assets are included in operating expense. The asset cost and accumulated depreciation are removed from the accounts for assets sold or retired, and any resulting gain or loss is included in income.

Intangible assets Intangible assets, including purchased patents, drawings, agreements and goodwill, are amortized over their estimated useful lives of from five to ten years.

Income taxes Deferred income taxes are provided for timing differences between financial and tax income. Current income tax liabilities include deferred taxes related to current assets. Deferred taxes recognize timing differences, principally with respect to depreciation and contract accounting. Deferred tax provisions are made for foreign subsidiaries' undistributed earnings which are not expected to be reinvested. Investment tax credits are recognized currently by reduction of the provision for income taxes, limited to estimated realizable amounts.

Merger with Southern Industries Corporation

On June 1, 1979, Southern Industries was merged with Dravo upon the exchange of 2,003,137 shares of Dravo common stock for all outstanding common shares of Southern Industries. This exchange was on the basis of .6552 Dravo share for each Southern Industries share. The merger was accounted for as a pooling of interests and,

accordingly, all previously reported Dravo financial information, excluding dividends per share, have been restated to include Southern Industries.

The restatement of recently published information is as follows:

(In thousands, except per share)	First Quarter 1979	Year Ended December 31, 1978		
Revenue:				
As previously reported	\$159,487	\$845,424		
Southern Industries	27,870	113,620		
Restated	187,357	959,044		
Income before taxes:				
As previously reported	6,410	32,207		
Southern Industries	1,137	9,800		
Restated	7,547	42,007		
Net income:				
As previously reported	3,718	18,770		
Southern Industries	784	6,447		
Restated	4,502	25,217		
Earnings per share:				
As previously reported	.61	3.45		
Restated	.55	3.43		
As of December 31, 1978	Previously Reported	Southern Industries	Pooling Adjustment	Restated
Shareholders' equity:				
Capital stock	\$ 6,127	\$ 333	\$ 1,629	\$ 8,089
Other capital	39,304	9,753	(1,970)	47,087
Retained earnings	133,740	26,130	(827)	159,043
Treasury accounts	(3,968)	(1,168)	1,168	(3,968)
	\$175,203	\$35,048	\$ —	\$210,251

The pooling adjustment to shareholders' equity reflects the exchange of Dravo common shares for Southern Industries' outstanding common, which were stated at 10 cents per share par value, and the retirement of Southern Industries' treasury shares.

Accounts and notes receivable

Receivables at December 31 include:

(In thousands)	1979	1978
Trade receivables, net of allowance for uncollectibles of \$1.4 million in 1979 and \$1 million in 1978	\$ 89,769	\$ 79,820
Engineering construction contract receivables, net of allowance for uncollectibles of \$215 thousand in 1979 and \$196 thousand in 1978	90,215	75,160
Receivables, unconsolidated affiliates	6,462	7,987
Retainage:		
Due after contract completion	13,976	16,386
Deduct: Billings on contracts in progress	2,680	4,039
	11,296	12,347
	\$197,742	\$175,314

Net retainage includes \$2.1 million in 1979 and \$3.9 million in 1978 estimated to be collectible after one year.

Inventories and contracts in progress

Inventories and inventoried costs of engineering construction contracts at December 31 are classified as:

(In thousands)	1979	1978
Inventories:		
Finished goods	\$ 47,580	\$ 40,248
Work in process	3,474	4,187
Materials and supplies	23,741	20,828
Manufacturing contracts in progress	51,057	43,365
	125,852	108,628
Inventoried costs of engineering construction contracts	57,134	58,060
	182,986	166,688
Deduct: Billings on contracts in progress		
Manufacturing	48,049	37,373
Engineering construction	46,511	58,081
	94,560	95,454
Net inventories	\$ 88,426	\$ 71,234

Finished goods inventories of contractors' equipment held for resale were \$30.2 million in 1979 and \$28.8 million in 1978 including units that have been used in rental service which had a carrying value of \$4.7 million in both years.

The inventories related to manufacturing activities valued on a LIFO basis, principally contracts in progress, amounted to \$22.6 million in 1979 and \$26.2 million in 1978. On a FIFO basis, which approximates replacement cost, these same inventories would be \$49.3 million and \$50 million. Other inventories, which are carried on a FIFO basis, were \$73 million and \$53.6 million at year-end 1979 and 1978.

Investments in and advances to unconsolidated affiliates

The principal unconsolidated affiliate is Dravo Leasing Company, a wholly-owned finance subsidiary; condensed information is presented on page 37.

Dravo also has an investment in Carbon County Coal Company, a partnership formed to mine and market coal from Wyoming reserves. The investment, which amounted to \$2.7 million at December 31, 1979, is accounted for on the equity basis. The company anticipates an eventual investment of \$8 million, in addition to \$25 million provided by an advance to the partnership by an institutional lender. This advance will be repaid out of Dravo's share of the facility's operating income and is supported by a Dravo commitment to ensure repayment.

Investments of \$5.4 million represent interests in foreign companies. This includes Dravotec, S.p.A. which was formed in 1979 to increase and combine equity participation in several Italian affiliates into a single engineering, construction and manufacturing organization.

Finance subsidiary

Condensed financial information of Dravo Leasing Company for the respective years ended December 31 follows:

Condensed Balance Sheet

(In thousands)	1979	1978
Cash	\$ 338	\$ 463
Receivables	66,083	69,501
Unearned finance charges	(23,992)	(25,584)
Equipment held for lease	1,270	2,145
Assets	\$43,699	\$46,525
Notes payable—current—banks	\$11,000	\$10,275
Notes payable—after 1 year—banks	18,975	22,275
Other liabilities	5,306	5,245
Due to parent	170	88
Subordinated debt—parent	761	3,474
Parent company's equity	7,487	5,168
Liabilities and equity	\$43,699	\$46,525

Condensed Statement of Income

Finance charges and rental income	\$ 5,246	\$ 4,140
Expenses and taxes	2,927	3,569
Net income	\$ 2,319	\$ 571

The 1979 receivable balance includes \$8.7 million due within one year. Notes payable include a \$22.3 million medium-term loan agreement with Chemical Bank; repayment in 28 quarterly installments began in December, 1979, with interest at 8.4%. Dravo Corporation is obligated, in this agreement, to maintain certain ratios of income to fixed charges and equity to debt of Dravo Leasing Company. Notes payable also include \$7.7 million of various 90-day notes.

Investment tax credits retained under leasing transactions are included in income in the year the equipment is acquired, but limited to values realizable in Dravo Corporation's consolidated tax return. Investment tax credits included in Dravo Leasing's net income were \$1.3 million in 1979 and -\$0.1 in 1978.

Notes Payable

Notes payable at December 31 include the following:

(In thousands)	1979	1978
Short-term:		
Notes payable	\$ 8,146	\$ 2,374
Current portion of long-term notes	4,613	5,630
Current portion of obligations under capital leases	1,283	1,220
	\$14,042	\$ 9,224
Long-term:		
7% cumulative income debentures, payable through 1982	\$ 4,755	\$ 5,260
7 1/4% notes, payable through 1982	3,900	5,525
7 1/4% bonds, payable through 1991	2,700	2,700
8% bonds, payable through 2002	10,454	10,918
8 1/5% bonds, payable through 1997	3,665	3,875
9 1/4% notes, payable 1981-1994	—	27,000
9.95% notes, payable 1982-1994	34,000	—
10% notes, payable in 1983 and 1984	10,000	—
9 1/4%-10 1/4% floating rate notes, payable in 1983 and 1984	15,000	—
Demand note, interest at prime	—	6,500
Other notes, payable through 1998	5,188	7,511
Obligations under capital leases	8,253	9,349
	97,915	78,638
Deduct: Current portion of notes and leases	5,896	6,850
	\$92,019	\$71,788

The 8% bonds of Dravo Mechling Corporation and the 8.15% bonds of Southern Industries Corporation are repayable semiannually and guaranteed by the U. S. Maritime Administration.

In January, 1979, Southern Industries Corporation issued \$34 million of 9.95% unsecured promissory notes. The terms of the note agreement require quarterly interest payments and, beginning 1982 through 1994, annual principal repayments of \$2.4 million. The agreement provides for optional prepayments beginning in 1984 within certain limits. The proceeds of this note were used to prepay the \$27-million 9 1/4% note and a \$6.5-million demand note. Restrictive covenants in the loan agreement include requirements for Southern Industries to maintain a certain working capital level and limit the incurrence of debt and lease obligations, the payment of dividends to Dravo, the sale of assets or stock of Southern Industries' subsidiaries and the creation of liens on Southern Industries' assets.

In October, 1979, a \$25-million medium-term loan agreement was completed. The loan includes \$10 million at a

10% fixed interest rate repayable in two installments, in 1983 and 1984, and \$15 million at a floating rate of 108% of prime, limited to a maximum of 10¾% and a minimum rate of 9¼%, repayable in three equal consecutive semi-annual installments commencing October, 1983. The loan is unsecured and can be prepaid after one year at varying premiums. Restrictive covenants in the loan agreement include requirements for minimum tangible net worth and limitation on additional debt and lease obligations, substantial sales of assets, cumulative capital expenditures and cumulative dividends.

Net book value of property pledged under certain notes and leases was \$29.3 million at December 31, 1979.

Amounts payable on note and lease obligations due after 1980 are: 1981, \$4.2 million; 1982, \$9.6 million; 1983, \$14.1 million; 1984, \$19 million; 1985, \$3.9 million; and after 1985, \$41.2 million.

Deferred revenue from future mineral production

Dravo Lime Company has conveyed mineral reserves and assigned proceeds of lime sales contracts for advance production payments of \$60 million, of which \$55.4 million remains as of December 31, 1979. Repayment with interest at 9.58% is scheduled semiannually through 1991. During this period the related contract revenues are expected to exceed \$300 million.

Retirement plans

Under the company's retirement plans for salary and hourly employees, the expenses were \$12.2 million in 1979 and \$11 million in 1978. The 1979 expense reflects a normal increment over the previous year attributable to increased participation and pay increases. Prior service costs are being amortized principally over 30 years. The company's policy is to fund the cost accrued. At December 31, 1979, the estimated actuarial value of vested benefits exceeded the fund assets, at market, by \$5.5 million.

Commitments and contingent liabilities

Total rental expenses for 1979 and 1978, excluding short-term rentals associated with construction contracts, were \$33 million and \$25.8 million, respectively. The minimum future rentals under noncancelable operating leases and future rental receipts from a sublease to a third party as of December 31, 1979 were:

(In thousands)	
1980	\$12,886
1981	12,448
1982	12,158
1983	9,366
1984	6,749
After 1984	9,223
Total minimum payments required	62,830
Less: Sublease rental receipts	9,334
	\$53,496

On March 1, 1979, an Order and Judgment was made in a United States District Court in the case of Water Tunnel Contractors, in which the company is a 25-percent participant, against the City of New York involving construction of Water Tunnel No. 3. The Judgment provided for the dismissal of all claims and counterclaims, payment of \$23.5 million to Water Tunnel Contractors by the City of New York and the vacating of a declaration of default against the joint venture.

Gibbs & Hill, Inc., a wholly-owned subsidiary, has a minority interest in an Iranian-registered affiliate which is performing engineering design and construction management services for the installation of electric transmission lines and substations in Iran. Receivables due from the affiliate total \$3.4 million, and Gibbs & Hill has a contingent liability under letters of credit issued by a United States bank for \$2.6 million. Work on the contract is being continued by the affiliate's Iranian nationals.

Shareholders' equity

Restatement of shareholders' equity following the June, 1979 merger with Southern Industries, which increased common shares outstanding approximately two million shares, is explained in a separate note on page 35.

In January, 1979, the assets of the Criss & Shaver group of companies were acquired for cash and issuance of 132,891 common shares. This acquisition was treated as a purchase and increased the par value of common stock \$133 thousand and other capital \$3.6 million. In 1979 and prior to the merger, Southern Industries issued common shares, equivalent to 41,835 Dravo shares, for options and warrants exercised. In April, 1978, 26,817 shares of Series A preference stock were converted into common stock by the issuance of 53,634 common shares. The 165,516 Series B preference shares outstanding, callable for \$9.1 million, are convertible into 354,866 common shares. In September, 1978, 800,000 new shares of common stock were issued, increasing the par value of common stock issued by \$800 thousand and other capital by \$21.4 million. Common shares issued in 1978 by Southern Industries for options and warrants exercised were equivalent to 105,585 Dravo shares.

The company reacquired 66,940 common shares for \$1.8 million in 1979 and 66,797 common shares for \$1.9 million in 1978. Sales of treasury common shares to employees amounted to 50,372 shares with a cost of \$1.3 million in 1979 and 25,173 shares with a cost of \$692 thousand in 1978. The other principal treasury stock transactions were the sale of 42,180 shares with a cost of \$937 thousand in 1979 and 57,270 shares with a cost of \$1.1 million in 1978 for stock options exercised.

Stock options and stock appreciation rights

The following summary shows the changes during 1979 in the outstanding options for common stock and stock appreciation rights:

	Stock Options (1973 Plan)	Stock Appreciation Rights (1978 Plan)	Price
Outstanding, January 1, 1979	127,230	88,500	\$22.22-\$30.19
Granted during year	—	7,500	\$26.69-\$30.81
Exercised during year	(42,180)	—	\$22.22
Forfeited during year	(17,600)	—	\$22.22
Outstanding, December 31, 1979	67,450	96,000	\$22.75-\$30.81

Of the options outstanding under the 1973 Plan, 63,250 shares were exercisable at December 31, 1979. Under a stock option plan of Southern Industries, options for 2,621 shares at \$10.21 per share were exercised in 1979 prior to the merger. The exercise of options does not necessitate a charge or credit to income.

Under the 1978 Plan, options may be granted either alone or in tandem with related stock appreciation rights or stock appreciation rights may be granted separately. The price of stock and the basis of stock appreciation rights so granted is the fair market value on the date of grant. Any incremental value of stock appreciation rights granted is recognized as expense; \$213,000 was accrued in 1979.

At December 31, 1979, there were 38,370 shares available for granting common stock options under the 1973 Plan and 154,000 shares available for granting common stock options and/or stock appreciation rights under the 1978 Plan.

Interest capitalization

In accordance with Statement 34 of the Financial Accounting Standards Board, the company adopted a policy of capitalizing interest. Amounts capitalized in 1979 were not material.

Income taxes

The provisions for income taxes at December 31 are:

(In thousands)	1979	1978
Current:		
Federal	\$ 8,461	\$ 2,714
Foreign	768	3,412
State	3,832	3,565
	13,061	9,691
Deferred:		
Federal	6,486	7,211
Foreign	(335)	(112)
	6,151	7,099
Total	\$19,212	\$16,790

Investment credits included in the provision for income taxes were \$7.6 million in 1979 and \$5.6 million in 1978.

At December 31, 1979, tax benefits of \$3.1 million for investment credits expiring in 1983 and later, and \$592 thousand in foreign tax credits expiring in 1981 and later, have been recognized as a reduction of deferred tax liabilities. Income taxes have not been provided for accumulated DISC income of \$7.2 million at December 31, 1979, because it is the intention of management to reinvest this income in qualified assets. Current income tax liabilities include deferred taxes of \$5.7 million in 1979 and \$4.5 million in 1978.

Earnings per share

Earnings per share are based on net income less preference dividends declared in the year, divided by the weighted average of the sum of common shares outstanding during the year and the common share equivalents. Fully diluted earnings per share assumes conversion of preference shares outstanding.

Segment reporting

Information about the company's business segments and geographical areas of operation is provided on pages 29 and 30 of this report. The 1979 and 1978 segment financial data and descriptions on these pages are incorporated by reference in these notes.

Income contribution by segment or geographical area is total revenue less operating expenses, excluding: general corporate expenses, interest expense, interest income, income on sales between segments or geographical areas, income taxes and net earnings or losses of nonoperating subsidiaries including Dravo Leasing Company.

Tangible and intangible assets identified to a segment or geographical area, including an allocation of those that are jointly used, represent the assets employed in the operation of each segment. Cash, marketable securities and other assets that are controlled and held for general corporate needs are included as corporate items.

Foreign exchange adjustments

Foreign exchange adjustments were \$279 thousand expense, net of gains, in 1979, and \$478 thousand expense, net of gains, in 1978, all of which occurred within the respective years.

Interim financial information (unaudited)

(In millions, except earnings per share)	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1979				
Revenue	\$187.4	\$244.8	\$229.5	\$330.6
Gross profit	33.7	41.5	38.3	48.0
Net income	4.5	8.0	5.0	10.7
Earnings per share	.55	.99	.61	1.32
1978				
Revenue	\$182.5	\$192.1	\$228.1	\$356.3
Gross profit	25.1	36.7	35.8	47.9
Net income	2.2	6.9	5.9	10.2
Earnings per share	.30	.98	.80	1.35

Management's Responsibility

Dravo Corporation

The financial statements and other financial information included in this report are the responsibility of management. The statements have been prepared in conformity with generally accepted accounting principles and, in management's best judgment, fairly present Dravo's financial position and the results of operations.

Management maintains a sound system of internal control aimed at ensuring effective and efficient utilization of the company's assets, the accuracy and integrity of its financial records and fair reporting of its financial position and results of operations. The company applies high standards in selection, training and development of financial personnel, supports a broad program of internal audits, including international activities, and maintains a system of financial policies and guidelines to assure that operations are conducted in conformity with laws and with the company's commitment to a high standard of business conduct.

The Board of Directors fulfills its responsibility for the company's financial statements through an Audit Committee consisting entirely of outside directors. The Audit Committee meets periodically with company management, internal auditors and independent public accountants to ensure that each performs its respective responsibilities in an effective manner. The internal auditors and independent public accountants have free and independent access to the committee to discuss the results of their audit work and their opinions on the adequacy of internal financial controls and the quality of financial reporting.

The company's financial statements are audited by the independent public accountants, Main Hurdman & Cranstoun, who review internal controls, test accounting records, and perform such other auditing procedures as required by generally accepted auditing standards; their activities are coordinated with corporate internal audit programs.

Accountants' Report

Main Hurdman & Cranstoun certified public accountants

The Shareholders, Dravo Corporation

We have examined the consolidated balance sheet of Dravo Corporation and subsidiaries as of December 31, 1979 and 1978, and the related consolidated statements of income, retained earnings, and changes in financial position for the years then ended. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, such financial statements present fairly the financial position of Dravo Corporation and subsidiaries at December 31, 1979 and 1978, and the results of their operations and the changes in their financial position for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

Main Hurdman & Cranstoun

Pittsburgh, Pennsylvania
February 4, 1980

Dravo Corporation

Dollars in millions, except per share

	1979	1978	1977	1976	1975
Revenue	\$ 992.3	\$ 959.0	\$ 946.0	\$ 811.9	\$ 821.1
Gross profit	161.5	145.5	120.3	106.1	91.0
Interest expense	17.6	12.8	11.0	10.3	13.1
Income from continuing operations before income taxes	\$ 47.4	\$ 42.0	\$ 38.0	\$ 32.6	\$ 26.5
Provision for income taxes	19.2	16.8	14.8	12.4	10.5
Income from continuing operations	28.2	25.2	23.2	20.3	16.1
Discontinued operations and extraordinary item, net of income taxes	—	—	(5.7)	(.2)	9.8
Net income	28.2	25.2	17.5	20.1	25.9
Dividends declared	10.6	8.7	7.8	7.1	6.2
Per common share					
Income from continuing operations	\$ 3.47	\$ 3.43	\$ 3.30	\$ 2.96	\$ 2.49
Discontinued operations and extraordinary item	—	—	(.83)	(.03)	1.56
Net earnings	3.47	3.43	2.47	2.93	4.05
Dividends declared	1.28	1.16	1.05	.95	.875
Book value	28.03	25.91	23.61	22.26	20.42
Billings for work performed	\$ 1,014.4	\$ 917.8	\$ 849.5	\$ 829.4	\$ 773.0
Backlog—to be reported as revenue	\$ 1,286.0	\$ 1,011.0	\$ 1,032.0	\$ 1,117.0	\$ 1,060.0
— to be performed	1,173.0	921.0	900.0	889.0	849.0
Total assets	\$ 616.1	\$ 542.2	\$ 478.6	\$ 450.4	\$ 412.0
Working capital	131.8	111.2	63.8	28.5	56.5
Long-term obligations	147.5	129.6	116.8	99.9	123.1
Shareholders' equity	232.0	210.3	170.8	161.3	136.4
Property, plant and equipment					
Expenditures	\$ 49.0	\$ 33.5	\$ 24.2	\$ 61.2	\$ 60.8
Cost	417.7	383.2	360.8	350.8	303.8
Net book value	255.8	233.8	227.1	229.7	195.3
Depreciation	24.5	21.6	19.7	17.6	15.9
Shareholders at year-end	9,068	9,314	8,941	8,952	7,688
Employees at year-end	14,409	13,898	13,264	15,283	16,496

All amounts except dividends per share have been restated to include Southern Industries. Operations discontinued by Southern Industries prior to the merger were engaged in the sale and lease of construction equipment, phosphate mining, industrial and hardware supply and sugar refining. The sugar operation was sold in 1975 as

a result of the highly volatile raw sugar market which developed in 1974. The other operations were discontinued in 1976 and 1977. An extraordinary loss of \$443 thousand was incurred by Southern Industries in 1977 from debt retirement.

Supplemental Information

Dravo Corporation

The Effects of Changing Prices on Dravo

During the 1970's, inflation has become an unfortunate but persistent feature of the economies of most countries, including the United States. The Financial Accounting Standards Board (FASB), a rule-making organization for accounting and financial reporting, believed that users of financial reports need more information to understand the effects of changing prices on a business enterprise. For this reason, a new standard has been established requiring large public companies to include supplemental information in annual reports about the effects of changing prices.

This supplement contains data and information which is highly subjective and experimental. Yet, it may offer some insight into the effect of inflation.

Review of the Information

Corporate revenue during the past five years, in terms of 1979 constant dollars, reflects a balance between expanded natural resources operations and lower engineering construction revenues. Dravo's engineering construction activities have reported lower revenues due to a decrease in domestic industrial and public works construction spending. The expansion within the Southern Industries operation, along with the addition of Dravo Lime and Criss & Shaver, provided the revenue growth in the area of natural resources.

As expected, 1979 income adjusted for general inflation (constant dollars) and changes in specific prices (current costs) is below the \$47.4 million actual pre-tax income. This is principally from depreciation expense related to higher replacement values of long-lived assets engaged in manufacturing, marine transportation, and aggregates extraction and processing. Income adjustments related to inventories are low, due to Dravo's use of LIFO inventory valuation for manufacturing operations.

This downward adjustment in income should be compared to the \$16.1-million purchasing power gain on net amounts owed. During periods of inflation, monetary assets decline in value since the dollar loses purchasing power when it is held. Conversely, dollars with less value will be used to satisfy monetary liability obligations such as current and long-term notes payable. Dravo, like most companies, has monetary liabilities in excess of monetary assets.

In accordance with the FASB rules, no adjustment has been made to income taxes. The effect, as income decreases when adjusted to reflect constant dollars and current costs, is to increase the effective tax rate in 1979 from 40.5 percent to 60 percent for constant dollar results and 66 percent for current costs. This distorts the adjusted income after taxes and earnings-per-share data, but illustrates the magnitude of the tax burden placed on capital investment-oriented operations by present tax laws.

As shown in the five-year comparison, dividend increases have outpaced general inflation. The \$1.28-per-

share 1979 dividend is 9.4 percent higher than 1975's dividend adjusted to \$1.17 for an equivalent dollar value. Management evaluates its dividend policy with respect to inflation and changing interest rates in order to maintain the attractiveness of Dravo common stock as a viable long-term investment.

The higher net asset values give effect to the estimated cost to replace inventories and, particularly, property, plant and equipment. To maintain productive capability, Dravo has renewed and expanded the productive life of certain plants and equipment through capital expenditures. New or modernized facilities for grating and marine equipment fabrication are prime examples. Also, nearly \$50 million of new towboats and barges have been added to Dravo Mechling and Natural Resources fleets during the past five years. Other new facilities include Dravo Lime's mine and processing plant, which began operations in 1977; the Georgetown, Pennsylvania aggregates plant, completed in 1976; and the pipe fabrication facility at Charlotte, North Carolina.

Constant Dollars (Adjustments for General Inflation)

Constant dollar information presents historical data adjusted for changes in general inflation and general purchasing power. This change is measured by the Consumer Price Index, and adjustment restates historical data to a common unit of value—average 1979 dollars.

Constant dollar information has been determined by applying the Consumer Price Index for all urban consumers. Revenue and dividends per share for the past five years are restated in average 1979 dollars. Common stock market prices for the past five years reflect year-end 1979 dollars. 1979 income and earnings in constant dollars shows the effect of restatement of inventory and depreciation expense on cost of goods sold in average 1979 dollars.

Current Cost (Adjustments for Changes in Specific Prices)

The adjustment of data for changes in specific prices is a method of measuring assets and expenses associated with the use or sale of assets, at their current cost at the balance sheet date (December 31, 1979) or at the date of use or sale. Current costs must be determined for identical assets regardless of technologically improved alternatives and management's intent to replace. This approach is intended to provide information for the assessment of the impact of potential replacement of inventories and fixed assets on future income and cash flows. The information, however, does not reflect specific plans for future replacements.

Income and earnings reported for 1979 have been adjusted for the theoretical effect of current costs on depreciation expense and the cost of goods sold from inventory. Property, plant and equipment cost and related accumulated depreciation have been adjusted to reflect current costs in the following manner: land and mine development

Income adjusted for changing prices

(In millions, except per share)

	As Reported In Primary Statements	Adjusted for General Inflation (Constant Dollar)	Adjusted for Changes in Specific Prices (Current Costs)
Year ended December 31, 1979			
Income before taxes	\$ 47.4	\$ 47.4	\$ 47.4
Adjustments to restate costs and expenses for changing prices:			
Inventories charged to costs of construction, products and services	—	(5.6)	(3.7)
Depreciation and amortization expense related to costs of construction, products and services	—	(9.1)	(14.1)
Depreciation and amortization expenses related to selling, administrative and general expenses	—	(.8)	(.4)
Income before taxes, after adjustments	47.4	31.9	29.2
Provision for income taxes	19.2	19.2	19.2
Net income	\$ 28.2	\$ 12.7	\$ 10.0
Earnings per share	\$ 3.47	\$ 1.54	\$ 1.20
Gain from decline in purchasing power of net amounts owed	—	\$ 16.1	\$ 16.1
Net assets (equity) at year-end	\$232.0	\$396.1	\$443.2

Selected data in 1979 constant dollars

	1979	1978	1977	1976	1975
Revenue:					
—as reported	\$992.3	\$ 959.0	\$ 946.0	\$ 811.9	\$ 821.1
— in 1979 constant dollars	992.3	1,062.1	1,127.9	1,030.5	1,100.3
Common stock dividends per share:					
—as reported	1.28	1.16	1.05	.95	.875
— in 1979 constant dollars	1.28	1.28	1.25	1.21	1.17
Market price per common share at year-end:					
—as reported	31.00	28.25	28.00	23.00	19.25
— in 1979 constant dollars	31.00	32.06	34.65	30.39	26.66
Average Consumer Price Index	216.4	195.4	181.5	170.5	161.5

by a general inflation index (CPI); buildings and improvements by a plant and building index system; floating equipment by vendor price quotations or estimates; machinery and other equipment by vendor price quotations or estimates for major components and producer price indexes on all remaining categories. Fixed assets in foreign locations were valued using local prices or indexes to the extent available. Inventories have been adjusted as follows: materials and supplies by vendor prices and producer price indexes; work-in-process and finished goods by current standard costs of manufacture, extraction or processing and vendor prices on resale items. Inventoried costs of

contracts in progress are included at historical values as suggested by the FASB; since contract revenue and cost are stated in similar dollars, conversion would not add to the information.

The current cost of inventories at December 31, 1979 was \$123 million and the current cost of property, plant and equipment, net of accumulated depreciation, was \$446 million. The general inflation factor (CPI) applied to property, plant and equipment held during 1979 would reflect an increase of \$64.5 million, while specific price increases determined for those same assets amounted to only \$53 million.

Products and Services

Dravo Corporation
 International Headquarters
 One Oliver Plaza, Pittsburgh, Pa. 15222
 Telephone: 412 566-3000; Cable DRAVOCO
 Telex: 86-6125 DRAVO PGH

Dravo Engineers and Constructors

Worldwide engineers, designers, constructors, project and construction managers

Chemical Plants Division

Petrochemicals, petroleum, polymers; Chlor-alkali; Hydrometallurgy; Inorganic chemicals; Pulp & paper; Synthetic fuels; Water & waste treatment; Extraction, food processing

Minerals & Metals Division

Coal preparation; Uranium mines and mills; Iron ore agglomeration and beneficiation; Steel mills; Nonferrous beneficiation, smelting and refining; Industrial minerals beneficiation; Coke and byproduct plants; Pollution control facilities; Plant testing, maintenance and operation

Civil, Mining & Marine Division

Major civil works; Mine development and operation; Marine facilities; Irrigation and agriculture

Dravo Van Houten, Inc.

Facilities for offshore & onshore oil and gas production, storage and transportation; Ports, harbors and coastal engineering; General consulting engineering and project management

Gibbs & Hill, Inc.

Nuclear, fossil and hydroelectric power plants; Power transmission and distribution; Transportation; Environmental; Urban development and master planning; Civil and architectural

Dravo Utility Constructors, Inc.

Construction, construction management, plant startup, testing, maintenance, operation and operator training for utility and industrial facilities

Manufacturing Group

Manufacturers of equipment for marine transportation, bulk materials handling, heating, ventilating and air conditioning; Process equipment and specialized heavy machinery; Pipe fabricators; Grating and pipe handrail manufacturers

Engineering Works Division

Towboats, barges and other marine equipment; Bulk materials handling equipment and systems; Specialized heavy machinery and equipment

Dravo SteelShip Corporation

Workboats, small towboats, offshore vessels and patrol craft

Dravo Lectro Quip

Systems for removing fats, oils and solids from liquids in industrial processes

Dravo Technology Services

Technology for optimizing performance of materials handling and manufacturing equipment installations

Fabricated Products Division

Dravo/Hastings industrial and commercial heating, ventilating and air conditioning equipment; Tru-Weld® fabricated steel grating, stair treads and handrail systems

Pipe Fabrication Division

Fabricated piping and pressure vessels for the power, chemical, refining and other industries

General Offices: One Oliver Plaza, Pittsburgh, Pa. 15222
 Telephone: 412 566-3000

One Oliver Plaza, Pittsburgh, Pa. 15222
 Telephone: 412 566-3000
 Office: Kenilworth, N.J.

One Oliver Plaza, Pittsburgh, Pa. 15222
 Telephone: 412 566-3000
 Denver Operations: Dravo Building, 1250 14th Street, Denver, Col. 80202
 Telephone: 303 893-4500; Telex: 45-930 DRAVO CORP DVR

One Oliver Plaza, Pittsburgh, Pa. 15222
 Telephone: 412 566-3000
 Office: Denver

One Penn Plaza, New York, N.Y. 10001
 Telephone: 212 695-2244; Telex: 126390 VANENGER NYK

393 Seventh Avenue, New York, N.Y. 10001
 Telephone: 212 760-4000; Cable: GIBBSHILL, NEW YORK
 Telex: 127636 GIBBSHILL NYK
 Dallas Operations: 12606 Greenville, Suite 100, Dallas, Tex. 75243;
 Telephone: 214 783-0209
 Omaha Operations: 8420 W. Dodge Road, Omaha, Neb. 68114
 Telephone: 402 391-0330
 Offices: Atlanta, Cupertino, Cal., Denver, Washington, D.C.

393 Seventh Avenue, New York, N.Y. 10001
 Telephone: 212 760-4000
 Office: Anchorage

General Offices: Neville Island, Pittsburgh, Pa. 15225
 Telephone: 412 777-5000

Neville Island, Pittsburgh, Pa. 15225
 Telephone: 412 777-5000
 Offices: Denver, New Orleans, St. Louis

Route 4, Box 76, Pine Bluff, Ark. 76102
 Telephone: 501 536-0362

Neville Island, Pittsburgh, Pa. 15225
 Telephone: 412 777-5000

Neville Island, Pittsburgh, Pa. 15225
 Telephone: 412 777-5000
 Offices: Chicago, Houston, New York, Tulsa

1115 Gilman Avenue, Marietta, Ohio 45750
 Telephone: 614 373-7541; TWX: 810-486-2808
 Offices: Charlotte, Chicago, Kansas City, New York, Philadelphia, Pittsburgh, San Francisco

Government Relations Office
1801 K Street, NW, Washington, D.C. 20006
Telephone: 202 785-1491

Natural Resources Group

Producers of aggregate, concrete, coal, Thiosorbic® and chemical lime and Calcilox® stabilizing agent

Aggregates Division

Sand and gravel; Ready-mixed concrete; Concrete block; Limestone fines

Charleston Region

General Offices: One Oliver Plaza, Pittsburgh, Pa. 15222
Telephone: 412 566-3130

Cincinnati Region

One Oliver Plaza, Pittsburgh, Pa. 15222
Telephone: 412 566-3545

Pittsburgh Region

201 Washington Street, E., Charleston, W. Va. 25311;
Telephone: 304 345-6100

Dravo Coal Company

Low-sulfur steam coal

One Oliver Plaza, Pittsburgh, Pa. 15222
Telephone: 412 566-3619

Dravo Lime Company

Thiosorbic® lime for stack gas SO₂ removal, metallurgical and chemical lime; Calcilox® stabilizing agent and systems

One Oliver Plaza, Pittsburgh, Pa. 15222
Telephone: 412 566-3130
Wyoming Operations: P.O. Box 370, Hanna, Wyo. 82327
Telephone: 307 325-9471

Other Subsidiaries

Dravo Equipment Company

Sale and rental of construction, mining and logging equipment;
Sale of industrial equipment

General Offices: One Oliver Plaza, Pittsburgh, Pa. 15222
Telephone: 412 566-4955

Dravo Doyle

Route 19 North, P.O. Box 2881, Pittsburgh, Pa. 15230
Telephone: 412 322-4500

Dravo Cal-Ore

P.O. Box 24367, Seattle, Wash. 98124
Telephone: 206 271-2500; Telex: 32-8075 CALOREMAC TKLA

Dravo Marks

1500 Industrial Parkway, Brunswick, Ohio 44212
Telephone: 216 225-3133; TWX: 810-437-2371 DRAVOMARK BRSK

Dravo Mechling Corporation

Barge transportation on the U.S. inland waterways

General Offices: One Oliver Plaza, Pittsburgh, Pa. 15222
Telephone: 412 566-3900; TWX: 710-664-4457 UNIONMEC PGH
Offices: Baton Rouge, Chicago, Houston, Joliet, New Orleans, Summit, N.J.

Livsey & Company, Inc.

Industrial contractor

P.O. Box 49563, Atlanta, Ga. 30359
Telephone: 404 938-6220

Southern Industries Corporation

Shell, sand, gravel, slag, stone; Ready-mixed and asphaltic concrete, concrete block; Chemical and agricultural lime; Poultry feed supplement; Filler material for industrial rubber products

General Offices: 61 St. Joseph Street, P.O. Box 1685, Mobile, Ala. 36601;
Telephone: 205 438-3531

Radcliff Materials, Inc.

McDuffie Island, P.O. Box 2068, Mobile, Ala. 36601
Telephone: 205 432-2651

Round Rock Lime Company

Highway 174, P.O. Box 38, Blum, Tex. 76627
Telephone: 817 874-5221

SI Lime Company

McDuffie Island, P.O. Box 2947, Mobile, Ala. 36601
Telephone: 205 432-2145

SI Minerals, Inc.

4035 S. Florida Avenue; P.O. Box 5108, Lakeland, Fla. 33803
Telephone: 813 646-5741

Southern Stone Company, Inc.

2111 Eighth Avenue, S. Birmingham, Ala. 35233;
Telephone: 205 252-6104

Dravo International

Coordinators of international activities through regional offices

General Offices: One Oliver Plaza, Pittsburgh, Pa. 15222
Telephone: 412 566-3000

Europe and Africa

Piazza degli Affari, 3, Milan 20123, Italy;
Telephone: (39-2) 860-453; Telex: 331839 DRAVCO I

Far East

Air Mail Distribution Center, Manila International Airport, P.O. Box 7570, 3120-Philippines:
Telephone: (63-2) 59-91-23; Telex: 7420510 BRUCE PM

Middle East

One Oliver Plaza, Pittsburgh, Pa. 15222;
Telephone: 412 566-5041; Telex: 86-6125 DRAVO PGH
P.O. Box 10365, Riyadh, Saudi Arabia;
Telephone: (966-1) 46-43569; Telex: 202014 SAMIYA SJ

Latin America

Apartado 70612, Los Ruices, Caracas 107, Venezuela;
Telephone: (58-2) 283-7744; Telex: 21765 PLASBEN

International Subsidiaries & Affiliates

Africa

ALREM (Societe Algerienne de Realizations et D'Etudes Minieres)

Engineering and construction of minerals, mining and processing facilities

De Weger, Gruter & Partners

Supervision, design and construction of architectural projects

4/6 Boulevard Mohamed V, Algiers, Algeria;
Telephone: 63-79-52; Telex: 53006 DZ

P.O. Box 3504, Accra, Ghana;
Telephone: 66259

Australia

Dravo Pty. Ltd.

All Dravo products and services

30 Atchison Street, St. Leonards, N.S.W. 2065, Australia;
Telephone: (61-2) 439-4666; Telex: 21797 DRAVO AA
Perth Operations: 240 St. Georges Terrace, Perth 6000, W.A., Australia;
Telephone: (61-9) 322-1900; Telex: 92312 DRAVO

Monosteel (Newcastle) Pty. Ltd.

Overhead cranes, electric hoists

30 Atchison Street, St. Leonards, N.S.W. 2065, Australia;
Telephone: (61-2) 439-4666; Telex: 21797 DRAVO AA

Canada

Dravo of Canada Limited

All Dravo products and services

4935 Kent Street, Niagara Falls, Ontario, Canada L2H 1J6;
Telephone: 416 356-8559; Telex: 061-5201 DRAVO MFG NFS
Mining and Construction Operations: General Delivery, Garson,
Ontario, Canada P0M 1V0;
Telephone: 705 693-2701

Europe

Dravotec, S.p.A.

Engineering and construction services; Manufacturing

Piazza degli Affari, 3, Milan 20123, Italy;
Telephone: (39-2) 860-453; Telex: 331839 DRAVCO I

Borghi e Baldo Ingg., S.p.A.

General consulting engineering services

Via Amedie, 15, Milan 20123, Italy;
Telephone: (39-2) 8579; Telex: 320033 BBMIL I

Compagnia Elettrotecnica Italiana, S.p.A.

Electrical construction services; manufacturer of electrical components

Via Lago di Nemi, 25, Milan 20142, Italy;
Telephone: (39-2) 81811; Telex: 312545 CEIMIL I

Dravo Costruttori, S.p.A.

Engineering and construction services

Piazza degli Affari, 3, Milan 20123, Italy;
Telephone: (39-2) 860-453; Telex: 331839 DRAVCO I

F. C. de Weger Internationaal B.V.

Engineering and design services for marine facilities; Architectural services for offices, industrial facilities and airports

William Boothlaan 20, P.O. Box 705, Rotterdam 3002, The Netherlands;
Telephone: (31-10) 136-872; Telex: 24261 WEGER NL

IWACO B.V. (International Water Supply Consultants)

Water supply and sanitary engineering; Hydrological and geo-hydrological investigations

189 Schiekade, P.O. Box 183, Rotterdam 3000, The Netherlands;
Telephone: (31-10) 143-622; Telex: 24069 IWACO NL

Gibbs & Hill Espanola, S.A.

Electric power generation and transmission facilities

Magallanes 3, Planta 9, Madrid 15, Spain;
Telephone: (34-1) 448-25-12; Telex: 22268 GHESA E

Far East

Dravo (Hong Kong) Ltd.

All Dravo products and services

901 Hutchison House, 10 Harcourt Road, Hong Kong;
Telephone: (852-5) 266239; Telex: HX 74330 ASTER

Dravo Pacific Inc.

All Dravo products and services

P.O. Box 302/KBY, Jakarta Selatan, Indonesia;
Telephone: 774673; Telex: 47126 INCAS JKT

Filipinas Dravo Corporation

Architectural engineering and project management services

General Offices: 353 Buendia Avenue Ext.
Makati Metro Manila, Philippines
Telephone: (63-2) 86-66-51; Telex: 45510 CDCP PM

P. T. Triweger

Architectural, civil and marine engineering

P.O. Box 361 JKT & 120 KBT, Jakarta Selatan, Indonesia;
Telephone: 774673; Telex: 47126 INCAS JKT

Chuchawal-de Weger Internationaal Ltd.

Architectural, civil and marine engineering

P.O. Box BKK 11-1357, Bangkok, Thailand
Telephone: (66-2) 2515222; Telex: 84125 CWD TH

Dravo-Okura Co., Ltd.

Bulk materials handling equipment and systems

3-6, Ginza Nichome, Chuo-Ku, Tokyo 104, Japan
Telephone: (81-3) 535-3064; Telex: J22306

Latin America

EMP-Projetos, Comercio e Industria Ltda.

Design and construction of plants for minerals and metals processing, food processing and other industrial processes

Praca Olavo Bilac 28, Sala 608 Centro, 20.000 Rio de Janeiro, R.J., Brazil;
Telephone: (55-21) 232-3431; Telex: 2121390 XPRJ

Dravo de Mexico, S.A. de C.V.

Engineering, construction, project management and manufacturing services

Condominio Acero, Aragoza No. 1000, Monterrey, N.L., Mexico
Telephone: (52-83) 43-08-00

Middle East

Dravo Arabia Limited

Project and construction management, construction

P.O. Box 10365, Riyadh, Saudi Arabia;
Telephone: (966-1) 46-43569; Telex: 202014 SAMIYA SJ

Dravo Corporation

International Headquarters

Dravo Corporation
One Oliver Plaza
Pittsburgh, Pa. 15222
Telephone: 412 566-3000

Annual Meeting

The Annual Shareholders' Meeting of Dravo Corporation will be held April 24, 1980 at the William Penn Hotel, Pittsburgh, Pennsylvania. Formal notice of the meeting and proxy material will be mailed to shareholders on or about March 21, 1980.

Listing of Common Stock

New York Stock Exchange (DRV)

Transfer Agents and Registrars

Morgan Guaranty Trust Company of New York,
New York, N.Y.
Pittsburgh National Bank, Pittsburgh, Pa.

Additional Reports

More detailed information on the company's business is available in its Form 10-K filed annually with the Securities and Exchange Commission. Shareholders desiring a copy of this report for the most recent fiscal year may obtain it by written request to Mr. R. E. Mertz, Secretary, at the company's General Offices.

Dividend Reinvestment

An Automatic Dividend Reinvestment Plan is available for the convenience of interested shareholders. Information may be obtained from the Shareholder Records Department at the company's General Offices.

Dravo



AR51

SPRING 1979 DRAVO
REVIEW



With easily-tapped domestic supplies of petroleum and natural gas growing low and nuclear power encountering resistance from sectors of the public and government, coal has emerged as the primary short-term fuel for the nation's electric power needs.

Coal is our most abundant fuel. With reserves estimated at 1.5 trillion tons, the United States has enough recoverable coal to last 400 years, more than enough to safely carry us through a transition from oil and gas to new and possibly not-yet-discovered fuels.

This year more than 780 million tons of coal will be mined in the United States. Of this total some 545 million tons will be consumed by electric utilities.

A growing portion of this utility consumption is in the form of long-term, dedicated shipments from mines, many of which are located hundreds of miles

or more from the power plants which they serve. In particular, vast deposits of low-sulfur coal in the western states are just beginning to be mined.

Transportation of this coal is a major consideration in its use. Barges are the most economical way to move the massive tonnages of coal involved in power generation. Where this mode is not available, the development of unit trains has lowered the cost of moving coal by rail. In many cases, the best answer has proved to be a combination of the two modes. This in turn requires a transfer terminal where large tonnages can be efficiently shifted from one mode to the other and stockpiled as long as needed.

The site selection and design of the transfer terminal have a direct effect on the cost per ton of coal handled. The terminal must be located where rail and water transportation modes intersect. Ideally, coal should be shipped as far as

COAL ON THE MOVE

A large industrial stacker/reclaimer machine is shown at a coal storage facility. The machine has a long conveyor belt system that moves coal from a large pile on the left to a smaller pile on the right. The conveyor belt is supported by several metal structures. In the background, there are more piles of coal and some industrial buildings under a cloudy sky.

Approximately 4,000 tons of coal can be stacked hourly by this Dravo stacker/reclaimer at the Otto W. Sommér plant of the City Public Service Board of San Antonio. It reclaims at 2,000 tph.



possible by water. However, careful consideration must be made for the restrictions of the river such as locks and channel depth, as well as the restrictions of railroads such as interline transfers, operating procedures and others.

A recognized world leader in heavy bulk materials handling equipment, Dravo is experienced in the design and erection of terminals for the transfer of coal between barges, railroads, trucks or overland conveyors. Much of the equipment used in these systems is also designed and fabricated by Dravo. Included are continuous ladder and clamshell bucket ship and barge unloaders, ship and barge loaders and bucketwheel stacker/reclaimers with handling capacities up to 6,000 tons per hour.

Dravo has recently completed two major coal transfer terminals, one in St. Louis and the other near New Orleans, and is working on a third, at Cora, Illinois. Each can handle 10 million tons per year or more, compared to the average 2-4 million tpy handled at many older facilities.

Routing 10 million tpy through a terminal facility is a complex problem involving the proper combination of equipment and proper interaction between the receiving system, the loading system and the storage system.

At the Hall Street Terminal, designed and built for ACBL Western Inc. at St. Louis, several types of coal can be

transferred from incoming unit trains to unit barge tows. To handle these different types of coal, the terminal employs two receiving and reclaiming systems, a main storage system served by a stacker/reclaimer, and an auxiliary stack and reclaim system served by a radial stacker and an underground reclaim system.

The terminal also features a stationary luffing boom-type barge loader, a barge haul system and the necessary interconnecting conveyors. Barge loading can be handled by the system at a rate of 6,000 tons per hour.

On the average, 28,600 tons of coal are transloaded each day at the facility. Nearly 1,000 unit trains per year (each train is 100 cars long) will bring coal to the facility. It will be loaded onto more than 400 river tows.

A second coal handling terminal, designed for International Marine Terminals, is the Plaquemines Parish Terminal located 30 miles south of New Orleans. This 11 million-tpy terminal is a connecting link between the inland waterways and the ocean. Its main function is the transfer of coal from river barges to oceangoing barges or ships for transport to coastal users. The terminal was planned for three-phase construction. Phase I includes a 10-foot-wide continuous bucket unloader that will empty river barges at an average rate of a little more than 3,000 tons per hour. The

Left—The operator gets a close-up view of this clamshell digging bucket of a coal unloader designed and installed by Dravo at a power station in Lansing, Iowa.



Above—Rapid bottom-dump rail cars wait in line to deposit shipments of coal into a specially designed track hopper at the Crystal River Station in Florida.



Above—One of the initial river tows to dock at the recently completed Hall Street Terminal in St. Louis is loaded with coal delivered by unit trains and stockpiled in the facility's 45-acre storage area.



system will also load oceangoing barges at a rate of 4,000 tons per hour. Phase II calls for an extended loading dock and the addition of a traveling loader. A rail-mounted bucketwheel stacker/reclaimer with attendant storage is planned for Phase III.

The third coal handling terminal is under construction at Cora, Ill., 80 miles south of St. Louis. Dravo designed and is constructing the new rail-to-barge transfer terminal for Houston Natural Gas Corporation. Expected to go on-stream early in 1980, the terminal is designed to handle between 12 million and 15 million tons of coal annually. The terminal will transfer coal from rail cars to barges for movement southward to HNG customers and a river-to-ocean barge transfer terminal south of New Orleans.

In addition to transfer terminals such as these, Dravo is active in the design, fabrication and installation of coal handling equipment and systems at the power plants, themselves.

One such recent assignment was a turnkey unit train receiving facility designed and built for Florida Power Corporation's Crystal River Station. We designed and furnished an integrated system to handle bottom-dump rail cars which can accommodate the unloading of a 7,000-ton unit train in three hours. The system supplements the two pieces of handling equipment furnished ten

years earlier, a 1,450-ton per hour ocean barge unloader and a stacker/reclaimer.

Other representative current projects include:

- A bucket-elevator continuous barge unloader, designed to unload 5,000 tons of coal hourly, at the new Big Cajun No. 2 power station of Cajun Electric Power Cooperative, Inc., near Baton Rouge, La. and a similar but smaller unit for Allegheny Power System's new Pleasants Power Station in West Virginia.

- A clamshell bucket-type unloader, with a capacity of 1,250 tons per hour, at the Lansing Power Station of Interstate Power Company in Iowa.

- Two trencher-type stacker/reclaimers for Kansas Power & Light Company's Jeffrey Energy Center and a similar unit for the San Antonio City Public Service Board's Otto W. Sommer Station.

- Two track-mounted stacker/reclaimers for American Electric Power Company generating units in Indiana, and a similar unit to handle both coal and limestone at Indianapolis Power & Light Company's Petersburg Station.

Left—This is one of two stacker/reclaimers Dravo put into operation at the Jeffrey Energy Center, a unit of the Kansas Power & Light Company. The two machines provide for a total plant active storage capacity of approximately 72,000 tons of coal, and are designed to stockpile and reclaim under automatic control.



Left—This 11-million-ton per year terminal near New Orleans transfers coal from river barges to oceangoing vessels. Its continuous ladder unloader empties river barges at a rate of more than 3,000 tons per hour.





OIL IN THE 'BANK'

The United States' economy is heavily dependent on a continuous supply of oil for industry, power generation and transportation. Imports will account for more than half of this volume by 1980.

The embargo by Arab nations late in 1973 dramatically illustrated the effects of a disruption of this supply. Through the Energy Policy and Conservation Act of 1975, Congress directed the creation of a Strategic Petroleum Reserve (SPR) to diminish U.S. vulnerability to the effects of a severe petroleum supply interruption. The Department of Energy (DOE) is currently implementing the program, which provides for a "stockpile" of crude oil that can be withdrawn if needed and introduced into the domestic refining system.

The program is designed to store up to one billion barrels of crude oil, primarily in salt domes along the Gulf Coast. Salt domes are large salt deposits found underground, which may range in size up to 5,000 feet in diameter and in depth to 20,000 feet or more. These deposits provide a major portion of the salt produced in the United States. The domes are ideal "holding tanks," as salt is impervious to oil. In February, 1979, over 75 million barrels of crude oil had been stored in these underground storage facilities.

The SPR oil is being stored in several different locations in southern states. Dravo Utility Constructors, Inc., part of our New York-based subsidiary,

Left—These large caverns are formed by mining the salt in a pattern of different chambers, separated by 70-90 foot high salt columns which hold up the roof.

Gibbs & Hill, was recently awarded a three-year contract by DOE for operation and maintenance of storage sites located at Bryan Mound, Texas, and West Hackberry, Bayou Choctaw and Weeks Island, La., and a marine oil terminal in Saint James Parish, La. We will also expand the storage sites at Bryan Mound and West Hackberry by a technique known as leach filling, a wet mining process.

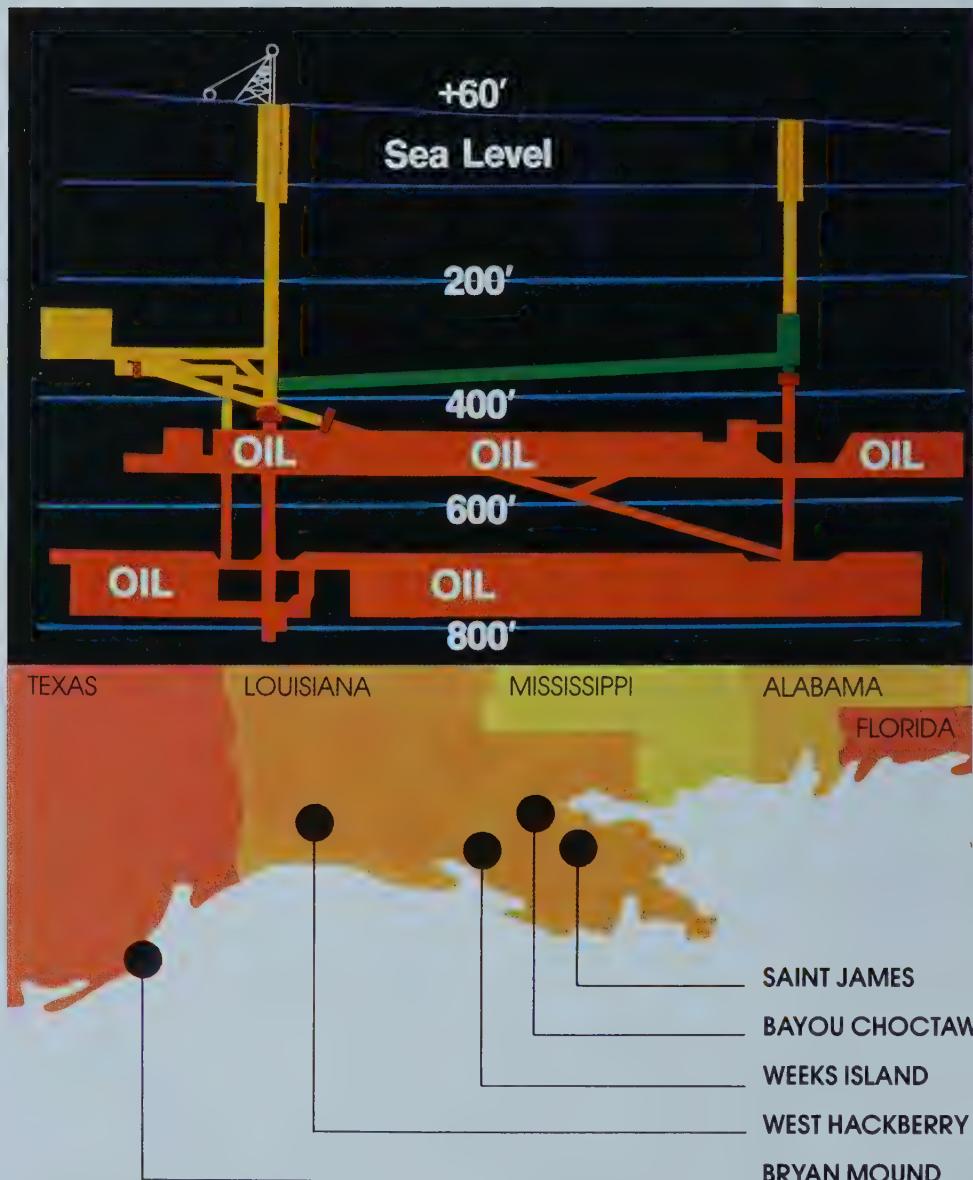
Salt can be mined either by wet or dry methods. The leaching method involves wells being sunk into a salt deposit. Each well includes two suspended casings and an outside cemented casing, forming a concentric three-way fluid conductor. Raw water is injected into one of the suspended well casings, and readily dissolves the salt as it soaks into it. The resulting brine solution is then forced to the surface through the

second suspended casing. In a commercial operation, the water is evaporated and the salt recovered. In this application, the leaching is done merely to enlarge the underground storage cavity. The salt will not be recovered, and the brine will be discharged by a pipeline extending far out into the Gulf. As the cavity enlarges, crude oil is injected through the outside cemented casing.

In the dry mining process, salt is taken from the ground like any other underground mining operation. Shafts and tunnels are dug, holes drilled and explosive charges set. The product is removed in trucks or by a conveyor system.

Only one of the SPR sites is a dry mine. This is the Weeks Island mine, purchased by DOE from the Morton Salt Division of Morton Norwich Products Inc. Another Dravo unit, our Civil,

Right—Drawings show how petroleum will be stored in lower levels of Weeks Island, La. salt mine while mining operations are still being conducted closer to the surface. Also shown are the locations of Weeks Island and other Strategic Petroleum Reserve facilities to be operated and maintained by Dravo.



Mining & Marine Division, has been working for over a year to convert this mine into an oil storage facility.

Conversion of the two-level mine involves grading loose salt, cleaning and scaling the roofs and walls, bolting rock where necessary, digging drainage channels and performing some minor excavations in the floors to establish flow patterns for the oil.

As part of the contract, Dravo was responsible for clearing the mine of loose debris. Because only a single nine-foot-diameter shaft was sunk when the mine was first opened in 1898, discarded materials were not taken out. Among the debris found left behind over the years were small-gauge locomotives and mining cars, dynamite boxes, railroad ties, and even old mule carcasses, well preserved by the salt air. Much of the debris was buried in floor

holes or recesses and backfilled.

The "rooms" within the mine are approximately 50-60 feet wide, and 70-90 feet high, large enough to have full-size dozers and cranes working underground. Getting the equipment through the access shafts (the original nine-foot shaft and an 18-foot shaft built later) was a minor problem. Most all major equipment was dismantled and reassembled again underground.

Morton Salt is still commercially mining at the Weeks Island site, so scheduling of equipment up and down the shafts was critical. This required work on a seven-day basis, three shifts daily, 365 days a year. More than 300 people are working to complete the project.

The facility is expected to begin receiving oil in September of this year, contingent upon the completion of an

overland pipeline which will bring the oil from tankers on the Mississippi River. When the oil flows, the storage area will be filled at a rate of up to 350,000 barrels per day. Its estimated capacity is 75,000,000 barrels, making it the largest of the five existing storage facilities.

The Weeks Island facility is being designed to hold the oil underground for up to 20 years. DOE plans call for oil to be internally cycled during periodic readiness tests and exercising of the equipment. Cycling will be done within the mine complex. A stirring system also will be installed to prevent solids from settling to the bottom of the mine, thus maintaining the specific gravity of the oil.

When the facility is completed, the oil can be pumped from the mine at a rate of approximately 590,000 barrels per day.

The fill lines, pumping lines and vent lines were also part of the Dravo installation. Work is being done from government designs, and some government equipment, such as pumps, is being supplied.

To seal out the water and hold in oil fumes, Dravo is installing two large concrete bulkheads, one at the top of each mine level or "tank." One is 30 feet in diameter by 20 feet high. Above the bulkhead will sit the manifold room where pumping, ventilation and safety equipment will be located. Once concrete for the bulkheads is poured, the mine will be permanently sealed.

In addition to operating and maintaining the Weeks Island and other crude oil sites, Dravo Utility Constructors will operate and maintain a network of crude oil pipelines connecting terminal facilities and the various storage sites.

Left—*Much of this heavy equipment was dismantled above ground and reassembled inside the mine because the access shafts are quite narrow.*



HARBOR 'HARVEST'

A massive clean-up operation is under way to help rid the Port of New York of a century's accumulation of debris.



One of the chief reasons for the growth of New York City has been its outstanding harbor. Today, however, outmoded waterfront facilities and high labor costs have lessened its importance as a port. And, increasingly, New Yorkers have begun to view the city's 578 miles of shoreline more as a lost opportunity than as an economic asset.

Gone is much of the bustle of the waterfront. Even further in the past are the days when New Yorkers could picnic on the shores of the city's rivers, or could buy fresh produce on Manhattan's piers from upstate farmers who came in by boat. Instead, many area piers are rotting or sinking. Sunken or derelict ships abound. Debris and drift continue to cause navigational problems

and damage to vessels.

Several influences, fortunately, are beginning to change this situation, according to William J. Funge, a vice president of our marine engineering subsidiary, Dravo Van Houten, Inc., which is headquartered in New York.

Growing public pressure is on to reclaim the waterfront for recreation purposes. Several grassroots operations have succeeded in turning empty piers and parking lots into valuable recreation areas.

Enforcement of the federal government's Clean Water Act is helping to clear up the raw sewage, and the Coastal Zone Management program, aimed at finding ways to accommodate competing needs, is forcing the city to develop

long overdue policies.

There is also the element of competition from other cities. Large waterfront recreation projects in Boston, Seattle, Philadelphia, Savannah and San Antonio are showing that recreation is big business.

"Of immediate impact," said Mr. Funge, "is a massive clean-up program directed by the U. S. Army Corps of Engineers and developed by Dravo Van Houten. The program is designed not specifically to create waterfront recreation areas but to eliminate dangerous and unsightly debris from New York Harbor."

"The plan calls for the dismantling and burning at sea of numerous drift debris sources that line the harbor in



New York and New Jersey. The total plan for debris source removal has been completed, and several areas have already been cleared.

"The first major result," Mr. Funge noted, "has been the development of Liberty State Park in Jersey City, N.J. This scenic park occupies land which had been in continued disrepair since World War I. It was built by the State of New Jersey, after the first phase of the Corps' clean-up program was completed in 1976.

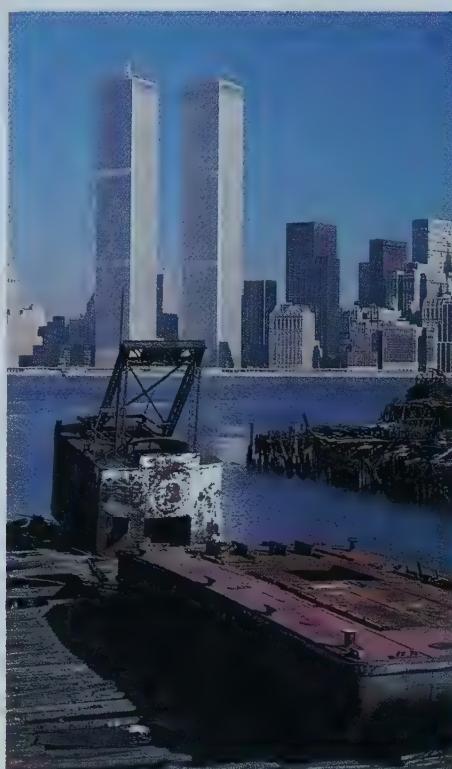
"Three additions are planned to the existing park," he added, "and eventually it will include a two-mile arched waterfront promenade providing a spectacular view of Manhattan's downtown skyline. The area behind the promenade will be a park with a serpentine lake."

The Corps and Dravo Van Houten estimate the total debris clean-up for New York Harbor will take at least 10 years to complete at a cost of approximately \$60 million.

About two-thirds of the funding for the clean-up comes from the Federal government, while the remaining third must come from communities within the harbor area if they participate in the program. The Federal government, however, will not contribute to the renovation of rundown, but useable, piers and buildings within the boundaries of the municipalities. Funds for these tasks must come from other sources.

"The benefits from the clean-up program are particularly important," Mr. Funge said, "because they represent the equivalent of nearly \$23 million annually to the local governments, the shipping industry, private boat owners, landowners and the federal government. These will result from fewer shipping and small boat accidents, increased harbor traffic speed, reduced shoreline and beach damage, and lower annual debris removal costs."

Such a clean-up program is a solution to a problem that has grown consistently since the Corps assumed responsibility for maintaining New York Harbor in 1915. During that year the Corps spent \$2,888 to collect 32,411 cubic feet of debris in the harbor. In 1974, more than \$1 million was spent collecting 666,057 cubic feet.



Rotting piers such as these will be dismantled as part of a massive clean-up program for New York Harbor by the Army Corps of Engineers. Debris will be put aboard barges and towed twenty miles to sea for disposal by burning.

When, over the years, the problem showed little sign of improvement, the Corps decided to eliminate the sources of drift material. Consequently, the Corps conducted a major survey of New York Harbor, which was done in the late 1960s and early 1970s. This led to Congressional funding for the clean-up program in 1974.

"Our work in the study consisted of site surveys and a number of boat trips



*William J. Funge
Vice President
Dravo Van Houten, Inc.*

around the harbor, covering the New York and New Jersey waterfront areas," said Mr. Funge. "Over 500 photos were taken of derelict vessels and run-down waterfront structures to be used with about 300 existing aerial photographs and a variety of maps. The Dravo Van Houten surveyors on site had to contend with packs of wild dogs roaming the piers, as well as individuals living on the old derelicts who protected their territory with handguns.

"For some of the structures we managed to unearth and obtain original 'as-built' drawings dating back to before the turn of the century to see what would be involved in demolition," he added. "Some of the railroad piers were so constructed that they could probably withstand a nuclear attack.

"A good many of the timber piles were found to be in excellent condition, having been protected from the marine borers by water pollution. Now that the water is being cleaned up, the piles are once again prey for the borers."

The preliminary clean-up plan indicates that more than 23.6 million cubic feet of potential drift debris will be removed before the project is completed. Of this, 10.2 million cubic feet will come from 2,230 abandoned vessels, 11.2 million will come from non-repairable shore structures and 1.3 million will come from debris lying along the shore. The timber debris is disposed of by burning at sea. Normally it is first allowed to partially dry out on collection barges and, subsequently, is transferred to a "burn-barge." This barge is then towed to an off-shore location where the entire load is ignited.

Where derelict vessels are concerned, they are refloated, when possible, and towed to another location where they are sunk. Vessels are often found to be abandoned and piled up two and three levels deep, some dating back to World War I days.

Phase II of the clean-up program has been established, with funding coming from the federal government and 54 local communities. Because of the large number of communities involved, the project will have to be done a section at a time. This is part of the reason why the complete clean-up is expected to take 10 years.

A CHALLENGE TO BUSINESS

From 1945 to 1965, a new college campus was established every two weeks in America. During that same period, and continuing to the present day, the role of government in our society has expanded at an unprecedented rate. The result, contends noted author-columnist-educator Michael Novak, is the creation of a new class of Americans which, for the first time in our history, has raised a serious challenge to the business class as the nation's primary elite.

The emerging group, Dr. Novak explains, looks to the public sector for its income and source of authority. This is in contrast to the members of the business class who depend upon the private sector for their career opportunities and economic well-being. In a recent appearance before Dravo managers, Dr. Novak described a "war of ideas" between the two sectors to determine which group would most influence the continuing character of American life. The following article was adapted from the conclusion of Dr. Novak's address.

Just as a whole new class of Americans emerges in such great numbers, there also comes a technology which strengthens their hand. It stems from the establishment and proliferation of nationwide communications media. National news magazines, around since the 1930's, are flourishing. Interpretive columns by nationally syndicated commentators appear in Pittsburgh as they appear in Phoenix, Topeka and Seattle. It is as if each city had the same newspaper; you read the same news everywhere you go. And of course, there are television, radio and cinema. The whole communications industry has a vested interest in reporting conflict and, because the industry feeds

very much on the actions of the public sector, it is particularly interested in reporting a war of ideas existing between the new elite and the business elite.

The existence of a strong national communications media gives tremendous advantage to the new class because of the group's strength in articulation, and of its effective use of symbols, myths and ideas. That's the business of the communications media, and that's the business of the consultants, government regulators and members of the helping professions. The function of this group is to straighten out people's ideas, to enlighten them, to teach them to handle their problems, to help them think straight. These are idea people and verbal people. And just as they have become strong in numbers, they have gained a new political instrument—the media—which gives power to ideas and symbols and myths. The result, often, has been a distortion of reality.

A business can produce the greatest product in the world, and it can provide absolutely outstanding service, but if the image gets around that something's wrong or suspect or unhealthy or in some other way damaging or inhumane, that product can be driven from the market. It used to be, that if business provided a good service, or a good product, it didn't have to worry about ideas.

But today, there's hardly anything that can be done without the influence of experts. And not only the experts in production and delivery, but also the experts who can communicate the idea of a product or service, make it under-

stood, have it seen in its proper light. There are a thousand ways of looking at anything, and all of them but one are wrong. Now it's a strange world where the more education you provide, the more unreality there is; the more perspective is important, the more ways of looking at things come to influence judgment. But that's the kind of world we live in and I think it is fair to observe that, by and large, businessmen have not been doing well in the struggle with the new class.

"...There are people thinking night and day, day and night, how to take away the power and freedom of the business community..."

All through the government, all through the media, all through the universities, there are people thinking night and day, day and night, how to take away the power and the freedom of the business community, and how to acquire that power and freedom themselves. This process is called liberation theology, and it does free people to do all sorts of things. But the one part of American life it does not free, the one it restricts more and more, is the area of capitalistic acts between consenting adults. Those have to be supervised. Those have to be controlled.

A whole new class of people, I'm contending, is strongly interested in finding things wrong with the way life is, in finding things wrong with the leadership of the business elite. They are also interested in developing new standards of values, morality and politics, and in shaping a new culture that will justify taking power from the business community and making decisions at the locations they control, namely within

administrative government. The control they exert, further, does not lie in the part of the government that is elected, but in the part which merely administers the law. Or they are in the courts. Both are safe from electoral politics.

It is a magnificent design. It is a way of acquiring power without submitting to the vote of the people and claiming to speak for the people without any way of putting that claim to the test. No practice could be more fundamentally in conflict with the founding principles of this country.

Most young people who go to the universities are, tests show, very much drawn toward what I call "statist" ideas. They become suspicious of free enterprise, business, liberal capitalism—even the West. Considering how few places in the world, at any time in human history, where open criticism has been possible, it is odd that student thought should be so one-sided.

There are other views of campus opinion. One recent survey by Lipsett and Ladd shows that 89 percent of all college professors think of themselves as strongly in favor of capitalism. But that 89 percent certainly does not set the tone. From teaching a recent graduate seminar in socialism and capitalism, I can report exactly what you would expect. The students come to such a seminar terribly suspicious of the claims on one side, and terribly drawn to the claims on the other. That, I think, is a serious problem in a society where the media are so important on a worldwide frame of reference, and in which, on the worldwide scene, ideas are more important to businessmen than they ever were.

Businessmen didn't have to care

about culture, about ideas, in any preceding generation. Businessmen believed if you built a better product, ideology would take care of itself. As I've noted, we're learning for the first time that if you build a better product, nobody may ever know it, or it may be so impugned for cultural or ideological reasons that no one will use it.

"In a time when ideas are more important than ever before, there is no statement of capitalistic purpose . . ."

In the past, corporate executives and managers were chosen because they were doers, not thinkers. They were willing to build a Pepsi plant in Leningrad, or a ball bearing plant in Moscow. They let ideology go. If they put up a better product, they knew the world would respect it and come to their door. But that isn't happening now. For the first time a generation of capitalists faces the need of developing its own theory.

That's the point I'm after. In a time when ideas are more important than ever before, there is no statement of capitalist purpose. Oddly, socialism has a beautiful theory. Most of those who are concerned about the issue get their ideas of socialism from books, and socialist books are beautiful. You read about brotherhood, the new man, the new woman, the new earth, the present—an essentially moral and religious vision. Only now, more than three decades after World War II, we have seen the effects of 30 years of socialism in 120 countries that call themselves socialist. For the first time, we can compare the vision with the reality. And the vision has been tarnished.

There were no special books or vision

about capitalism, only the reality. What students have done is look at the capitalist reality. Slums. Poverty. Inequalities. Inefficiencies. Then compare it to the socialist vision. But now we have a body of information about the socialist reality. And the equation is changed.

What we still lack is a body of capitalist theory. What is our vision? What is our goal? What sort of society do we want to build, and what sort of society do we want to depend on? An economic system like ours is not applicable in every sort of society. Our system is not really an economic system but a trinitarian system, economic and political. It's a market economy and a democratic policy. It's also a cultural system. Of ideas. Images and practices. Hard work. Discipline. Postponement of gratification. Savings. Investment. Skill. Achievement. Making the best out of yourself that you can.

Those ideas are not held in every society. Cooperation. Teamwork. Non-authoritarian managerial practices. We've had our Vince Lombardis and General Pattons. Every corporation has them; every organization has them. However, a lot of others cherish a model of authority much less directional, more suggestive, more through leading people indirectly, more keeping ears open. Not every culture has that kind of openness, that capacity. It concerns me greatly that we are defending a system—capitalism—that we don't have even one single book about.

We are defending a system which is not only free enterprise, it's democracy. We wouldn't believe in capitalism if it weren't democratic, too. What we defend is democratic capitalism. And we mean a very specific type of market

*Dr. Michael Novak
Fellow, American Enterprise
Institute, Washington, D.C.*

economy and democracy. If the hippies had a market economy and democracy, it would be different from what we want. If everybody just did his thing—no cooperation, no teamwork, no savings, no discipline—our system couldn't survive. So we have a cultural system we need to defend. I think the best name for that cultural system probably is pluralistic, or liberal, in the nonpartisan sense of the word. What we're trying to conserve are cultural attitudes, a cultural system, a morality, a way of dressing, a way of gesturing and so forth. All those things are linked together.

Every time a new elite comes along in history, it soon develops an ambition to make history over in its image. It seeks to develop a new politics, to establish a new style of dress, new attitudes, new values, new morality.

"There is a new class. Its great power over the media gives it the power of intimidation over ordinary American life."

This is the struggle I have been describing. There is a new class. Its great power over the media gives it the power of intimidation over ordinary American life. People who are out of tune with the media feel as though they are "not with it." The "it" that you are supposed to be with turns out to be those members of America's leadership elite who also belong to the new class.

We are in a war of ideas!

The writer Schumpeter said that capitalists would sell the rope to the hangman by which they would be hanged, and that because a new class would develop in the heart of capitalism, this

new class would turn capitalism against itself. Therefore, he predicted that in the long run of history, socialism would win out. Freedom is too difficult for the human race to support. But his intention, I believe, was not pessimistic.

I also believe most of the American people remain skeptical about both elites. The future very much depends on which wins this particular struggle; or at the very least there should be a stand-off, a check and balance between them.

As to developing a theory, it's important that corporations begin putting more money and more training into accumulating a cadre of intellectuals who will create the kind of theory, the kind of ideas that now are lacking. Corporations desperately need think tanks, people to think about public policies and where they will be five, 10, 20 years from now. A given organization must decide where it wishes to be versus public policy over, say, the next 20 years.

Corporations

can't afford to let the new class set the agenda, define the battle lines, and continue on the offensive. It is terribly important for those who believe in liberty for individuals as well as for corporations to set some of that agenda, to take the initiative in defining the issues. As it now stands, the intellectual elite of the new class have all the advantages. The rest of us are just fighting delaying battles and responding. And that's just not good enough.



'FACELIFT' FOR A BUSY RIVER LOCK

Opened 71 years ago, Lock No. 3 on the Monongahela is one of the busiest navigation structures on Pittsburgh district rivers, handling more than 23 million tons of cargo annually, much of it coal from southwestern Pennsylvania and West Virginia mines. It is one of six such facilities operated on the Mon by the U.S. Army Corps of Engineers.

Badly worn by weather and heavy traffic over the years, the lock is currently being given an \$11.3-million "facelift" by Dravo to keep it operating smoothly and efficiently for another 20 years or more.

The rehabilitation is being done without closing the lock to river traffic. The project's initial phase was a temporary extension of the lock's smaller chamber from 360 feet in length to 720 feet. This allowed the 720-foot-long main chamber to be closed for repairs while tows use the temporary chamber.

Upon completion of this work, traffic will revert to the renovated main chamber while the small chamber is rehabilitated and returned to its original length.

Repairs to the facilities include the stabilization and refacing of lock walls, installation of lock gate anchorages and installation of new machinery, hydraulic system and exterior lighting system. Completion of the project is scheduled for mid-1980.

The jobsite, just south of Elizabeth, Pa., is a familiar one to Dravo. The company built Lock 3 in the early years of the century under one of its first contracts from the Corps of Engineers.

We have been involved in work for the Corps almost continuously since that time and presently, in addition to the rehabilitation project, are building the \$63.1-million Richard B. Russell Dam on the Savannah River as sponsor of a two-company joint venture.

Right—*A "forest" of steel piling surrounds Dravo workers as they place concrete to cap the cells of a cofferdam built to temporarily extend the length of the lock's smaller chamber.*

Below—*Coal tow passes through busy Lock 3 on the Monongahela as a construction crew removes badly worn concrete facing from wall separating the lock's two chambers.*



Above—Steam-powered, wooden A-frame derricks provided the lifting power back in the early years of the century when Dravo built Lock 3 for the Army Corps of Engineers. Giant steel gates at upstream end of lock's smaller chamber are visible in background.



FLEXIBILITY FACTOR

Blasts of heat from casting operations create a widely varied set of needs for a foundry climate control system.

Heating large volumes of air in a constantly changing temperature environment can present a real challenge in setting up heating/ventilating/air-conditioning systems.

The Austin Company, a Cleveland-based engineering firm, recently solved this difficult problem as part of a major expansion of the facilities at Midland-Ross Corporation's National Castings Division foundry near Cicero, Ill. The foundry produces a variety of hot metal castings. The temperature is constantly changing within the foundry because of excessive heat given off during the casting process.

To provide a more effective distribu-



tion of warm air and improved temperature control, three Dravo *Counterflo* units with wide-range, combustion gas/oil burners were installed. They generate from 500,000 to 4,000,000 Btu's per hour, as outdoor conditions dictate, to supply heated make-up air for the 100,000-square-foot foundry area.

Because the foundry's network of overhead cranes ruled out rooftop installation, two of the units were mounted on the floor while the third was weatherproofed for installation outdoors on a wall.

The *Counterflo* units feature a 50,000-cfm rating and burners with an 8:1 turndown ratio to provide accurate

heating control. Normally, maximum heater turndown is 3:1 when oil is the primary fuel, as it is at the National Castings foundry.

The choice of the *Counterflo* heaters was based on National Castings requirement that it be able to vary the output of the units according to temperature conditions. The units have combination gas-oil burners with modulating temperature controls. With the controllers, a constant temperature of 65°F is maintained in the foundry.

The units have two other key aspects: they contain dust collectors to eliminate contaminants and are soundproofed to a noise level of less than 80 decibels.

Eight other smaller *Counterflo* units also were installed for space heating in other areas of the facility. Four were mounted on the floor and four in an inverted position so that heat could be directed toward floor-level.

National Castings plant engineer, Richard Rinner, has been pleased with the immediate advantages.

"With the Dravo units and their heat modulating mechanisms, we've achieved a better distribution of warm air and better temperature control—which have resulted in lower fuel consumption and improved working conditions," he said.



Glow from casting operations illuminates one of three large Counterflo heaters installed at the National Castings foundry to improve air distribution and temperature control.



International Headquarters

One Oliver Plaza, Pittsburgh, Pa. 15222; Telephone: 412 566-3000
Cable: DRAVOCO Telex: 86-6125 DRAVO PGH

Engineering Construction Group

Worldwide engineers, designers, constructors, project and construction managers

Chemical Plants Division

Petrochemicals, petroleum, polymers; Chlor-alkali; Hydrometallurgy; Inorganic chemicals; Pulp & paper; Synthetic fuels; Water & waste treatment; Extraction, food processing

General Offices: One Oliver Plaza, Pittsburgh, Pa. 15222; Telephone: 412 566-3000

Offices: Kenilworth, N.J.

Minerals & Metals Division

Coal preparation • Uranium mines and mills • Iron ore agglomeration and beneficiation • Steel mills • Nonferrous beneficiation, smelting and refining • Industrial minerals beneficiation • Coke and byproducts plants • Pollution control facilities • Plant testing, maintenance and operation

General Offices: One Oliver Plaza, Pittsburgh, Pa. 15222; Telephone: 412 566-3000

Western Operations Office: Denver

Civil, Mining & Marine Division

Major civil works • Mine development and operation • Marine facilities • Irrigation and agriculture

General Offices: One Oliver Plaza, Pittsburgh, Pa. 15222; Telephone: 412 566-3000

Offices: Denver, Seattle

Dravo Van Houten, Inc.

Offshore and onshore oil and gas production, storage and transportation facilities • Ports, harbors and coastal engineering • General consulting engineering and project management

General Offices: One Penn Plaza, New York, N.Y. 10001; Telephone: 212 695-2244

Gibbs & Hill, Inc.

Nuclear, fossil and hydroelectric power plants • Power transmission and distribution • Transportation • Environmental • Urban development and master planning • Civil and architectural

General Offices: 393 Seventh Avenue, New York, N.Y. 10001; Telephone: 212 760-4000

Cable: GIBBSHILL, NEW YORK

Telex: 127636 GIBBSHILL NYK

Operations Offices: Dallas, Omaha

Dravo Utility Constructors, Inc.

Construction, construction management, plant startup, testing, maintenance, operation and operator training for utility and industrial facilities

General Offices: 393 Seventh Avenue, New York, N.Y. 10001; Telephone: 212 760-4000

Manufacturing Group

Pipe fabricators; grating and pipe handrail manufacturers; manufacturers of process equipment, specialized heavy machinery and of equipment for marine transportation, bulk materials handling, heating, ventilating and air conditioning

Engineering Works Division

Towboats, barges and other marine equipment • Bulk materials handling equipment and systems • Specialized heavy machinery and equipment

General Offices: Neville Island, Pittsburgh, Pa. 15225; Telephone: 412 771-1200

Offices: Denver, New Orleans, St. Louis

Dravo SteelShip Corporation

Workboats, small towboats, offshore vessels and patrol craft

General Offices: Route 4, Box 76, Pine Bluff, Ark. 71602; Telephone: 501 536-0362

Dravo Lectro Quip

Systems for removing fats, oils and solids from liquids in industrial processes

General Offices: Neville Island, Pittsburgh, Pa. 15225; Telephone: 412 771-1200

Dravo Technology Services

Technology for optimizing performance of materials handling and manufacturing equipment installations

General Offices: Neville Island, Pittsburgh, Pa. 15225; Telephone: 412 771-1200

Fabricated Products Division

Dravo/Hastings industrial and commercial heating, ventilating and air conditioning equipment • Tru-Weld® fabricated steel grating, pipe handrail and stair treads

General Offices: 410 Rouser Rd., P.O. Box 9305, Pittsburgh, Pa. 15225; Telephone: 412 771-1200

Offices: New York, Tulsa

Pipe Fabrication Division

Fabricated piping and pressure vessels

General Offices: 1115 Gilman Avenue, Marietta, Ohio 45750; Telephone: 614 373-7541

Offices: Chicago, Kansas City, New York, Philadelphia, Pittsburgh, San Francisco

Equipment & Transportation Group

Water transportation, Equipment sale and rental

Union Mechling Corporation

Barge transportation on the U.S. inland waterways

General Offices: One Oliver Plaza, Pittsburgh, Pa. 15222; Telephone: 412 566-3900

Offices: Chicago, Houston, Joliet, Memphis, New Orleans, St. Louis, Summit, N.J., Tampa

Dravo Equipment Company

Sales and rental of construction, mining and logging equipment • Sale of industrial equipment

General Offices: Route 19 North, P.O. Box 2881, Pittsburgh, Pa. 15230; Telephone: 412 322-4500

Dravo Doyle

General Offices: Route 19 North, P.O. Box 2881, Pittsburgh, Pa. 15230; Telephone: 412 322-4500

Offices: Clearfield, Somerset, Pa.; Fairmont, W. Va.

Dravo Cal-Ore

General Offices: P.O. Box 24367, Seattle, Wash. 98124; Telephone: 206 271-2500

Offices: Medford, Redmond, Ore.; Spokane, Wash.; Redding, Cal.

Dravo Marks

General Offices: 1500 Industrial Parkway, Brunswick, Ohio 44212; Telephone: 216 225-3133

Offices: Canton, Cincinnati, Columbus, Hopedale, Maumee, Youngstown

Natural Resources Group

Producers of aggregates, concrete, coal, Thiosorbic® lime, Calcilox® stabilizing agent and industrial fuel gas

Dravo Coal Company

Low-sulfur coal

General Offices: One Oliver Plaza, Pittsburgh, Pa. 15222; Telephone: 412 566-3000

Dravo Fuel Gas

Low and medium Btu industrial fuel gas

General Offices: One Oliver Plaza, Pittsburgh, Pa. 15222; Telephone: 412 566-3000

Dravo Lime Company

Thiosorbic® lime for stack gas SO₂ removal, metallurgical lime • Calcilox® sludge stabilizing agent and systems

General Offices: 650 Smithfield Street, Pittsburgh, Pa. 15222; Telephone: 412 566-3000

Government Relations Office
1801 K Street NW, Washington, D.C. 20006
Telephone: 202 785-1367

Criss & Shaver, Inc.

Sand and gravel • Ready-mixed concrete
General Offices: P.O. Box 153, Charleston,
W. Va. 25321; Telephone: 304 343-4571

Keystone Division

Sand and gravel • Ready-mixed concrete,
concrete block
General Offices: One Oliver Plaza, Pittsburgh,
Pa. 15222; Telephone: 412 566-3000

Ohio Gravel Division

Sand and gravel
General Offices: 5253 Wooster Road,
Cincinnati, Ohio 45226; Telephone:
513 321-2700

Dravo International

Coordinators of company's international operations through regional international offices

General Offices: One Oliver Plaza, Pittsburgh,
Pa. 15222; Telephone: 412 566-3000

Regional Offices:

Europe

William Boothlaan 20, P.O. Box 705,
Rotterdam 3002, The Netherlands; Telephone:
(31-10) 136-872; Telex: 24261 WEGER NL

Far East

Air Mail Distribution Center, Manila
International Airport, P.O. Box 7570, 3120-
Philippines; Telephone: (63-2) 59-91-23;
Telex: 7420510 BRUCE PM

Middle East

One Oliver Plaza, Pittsburgh, Pa. 15222
Telephone: 412 566-5041; Telex 86-6125
DRAVO PGH

Latin America

Apartado 70612, Los Ruices, Caracas 107,
Venezuela; Telephone: (58-2) 283-7744
Telex: 21765 PLASBEN

International Subsidiaries & Affiliates

Africa

ALREM (Societe Algerienne de Realizations et D'Etudes Minieres)

Engineering and construction of minerals
mining and processing facilities
4/6 Boulevard Mohamed V, Algiers, Algeria;
Telephone: 63-79-52; Telex: 52934 DZ

De Weger, Gruter & Partners

Supervision, design and construction of
architectural projects
P.O. Box 3504, Accra, Ghana; Telephone:
66258

Australia

Dravo Pty. Ltd.

All Dravo products and services
30 Atchison Street, St. Leonards, N.S.W. 2065,
Australia; Telephone: (61-2) 439-4666
Telex: 21797 DRAVO AA

Canada

Dravo of Canada Limited

All Dravo products and services
4935 Kent St., Niagara Falls, Ontario, Canada
L2H 1J6; Telephone: 416 356-8559

Europe

Borghi e Baldo Ingg., S.p.A.

General consulting engineering services
Via Amedie, 15, Milan 20123, Italy;
Telephone: 8579; Telex: 320033 BBMIL I

Compagnia Elettrotecnica Italiana, S.p.A.

Electrical construction services •
Manufacturer of electrical components
Via Lago di Nemi, 25, Milan 20142, Italy;
Telephone: 8181; Telex: 312545 CEIMIL I

SOIMI (Societa Impianti Industriali, S.p.A.)

Mechanical construction services
Via Stilicone, 39, Milan 20154, Italy;
Telephone: 3102; Telex: 330229 SOIMI I

Dravo Costruttori, S.p.A.

Engineering and construction services
Piazza degli Affari, 3, Milan 20123, Italy;
Telephone: (02) 860-453; Telex: 331839
DRAVCO I

F. C. deWeger Internationaal B.V.

Engineering and design services for marine
facilities • Architectural services for offices,
industrial facilities and airports
William Boothlaan 20, P.O. Box 705,
Rotterdam 3002, The Netherlands; Telephone:
(31-10) 136-872; Telex 24261 WEGER NL

IWACO B.V. (International Water Supply Consultants)

Water supply and sanitary engineering •
Hydrological and geo-hydrological
investigations
189 Schiekade, P.O. Box 183, Rotterdam 3001,
The Netherlands; Telephone: (31-10) 143-778
Telex: 24069 IWACO NL

Gibbs & Hill Espanola, S.A.

Electric power generation and transmission
facilities
Magallanes 3, Planta 9, Madrid 15, Spain
Telephone: (34-1) 447-4800; Telex: 22268
GHESA E

Far East

Dravo Pacific Inc.

All Dravo products and services
P.O. Box 302/KBY, Jakarta Selatan, Indonesia;
Telephone: 774673; Telex: 47126 INCAS JKT

P. T. Triweger

Architectural, civil and marine engineering
P.O. Box 361 JKT & 120 KBT, Jakarta,
Indonesia; Telephone: 774673; Telex: 47126
INCAS JKT

Chuchawal-de Weger Internationaal Ltd.

Architectural, civil and marine engineering
P.O. Box BKK 11-1357, Bangkok, Thailand;
Telephone: 2515222

Dravo-Okura Co., Ltd.

Bulk materials handling equipment and systems
3-6, Ginza Nichome, Chuo-Ku, Tokyo 104,
Japan; Telephone: (81-3) 535-3064; Telex:
J22306

Latin America

EMP- Projetos, Comercio e Industria Ltda.

Design and construction of plants for minerals
and metals processing, food processing and
other industrial processes

Praca Olavo Bilac 28, Sala 608 Centro,
20.000 Rio de Janeiro, R.J., Brazil; Telephone:
(55-21) 232-3431; Telex: 2121390 XPRJ

Middle East

Dravo Arabia Limited

Project and construction management,
construction
P.O. Box 3886, Riyadh, Saudi Arabia;
Telephone: 43569; Telex: 201175

Gibbs & Hill Iran

Electric power generation and transmission
facilities
P.O. Box 41-2486, Jordan Ave., Arash St. 39,
Tehran 14155, Iran; Telephone: 228-805

Dravo

Neville Island, Pittsburgh, Pa. 15225
Address Correction Requested

SPRING, 1979 DRAVO REVIEW

Editor: R. J. Chidester
Staff Writer: R. W. Yearick
Chief Photographer: J. A. Dubas
Designer: Richard Fish



Page 2

Coal on the Move • Dravo, a recognized world leader in bulk materials handling systems, is building major transfer terminals for coal as the nation utilizes greater volumes of this valuable energy resource.



Page 8

Oil in the 'Bank' • The U.S. Government is using old salt mines to store large quantities of oil as part of the Strategic Petroleum Reserve program, which provides for a national "stockpile" of crude oil.



Page 12

Harbor 'Harvest' • A massive clean-up campaign is underway to remove debris in New York City's harbor. Our subsidiary, Dravo Van Houten, Inc., developed guidelines for the Army Corps of Engineers program.



Page 15

A Challenge to Business • Michael Novak, writer, philosopher, and critic, warns American business that it must prepare to combat a new elite class which is challenging it through a war of ideas.



Page 18

'Facelift' for a Busy River Lock • A major rehabilitation is being performed on heavily-used Lock No. 3 on the Monongahela River, near Pittsburgh, without closing the lock to river traffic.



Page 20

Flexibility Factor • A heating-ventilating-air conditioning problem was solved at an Illinois foundry where three Dravo Counterflo units now provide an effective distribution of warm air and improved temperature control.

DRAVO REVIEW

A quarterly publication of Dravo Corporation, One Oliver Plaza, Pittsburgh, Pa. 15222

THE COVER:

The setting sun silhouettes the bucketwheel of a trench-type stacker/reclaimer which Dravo designed and built for the Otto W. Sommer electric generating station in San Antonio, Texas.

BULK RATE
U.S. POSTAGE
PAID
Pittsburgh, Pa.
Permit No. 2127